News By Teletype From 4 News Bureaus

National Petroleum News

News From Oil Industry Everywhere

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Pumping Costs Should Control Price, Argued

By Teletype

TULSA, Oct. 18. — Stripper well operators of Oklahoma, meeting in their annual convention here today, were called upon by H. B. Fell, executive vice president of the Oklahoma Stripper Well Assn., to adopt a resolution "endorsing the economic soundness of basing the prices for refined products on the price of crude oil and of basing the price of crude oil on the average cost of producing from pumping wells."

"The resolution," said Mr. Fell, "could well include the condemnation of the retail division of an integrated company in cutting the price of gasoline and the purchasing division of that same company using that reduction as an excuse for cutting the price of crude oil, thus endeavoring to punish the crude oil producers for the mistakes of the other branches of the industry."

Meeting also today is the National Stripper Well Assn. The two organizations are closely affiliated with the Independent Petroleum Assn. of America whose annual convention begins in Tulsa, Oct. 19. Hotel reservations indicate a large attendance will be on hand.

No Change In Proration Policy Likely To Follow The Crude Cut

N. P. N. News Bureau

By LAWRENCE E. SMITH

TULSA, Oct. 17. — The situation which brought about the recent reductions in crude oil prices in the southwest is not comparable to that prevailing in 1931 and '32, when the governors of Oklahoma and Texas marched the state militia into the Oklahoma City and East Texas fields in an effort to bring order into a wild orgy of overproduction.

Today there is no great field which threatens to pour oil out by the million barrels at 10 cents, 25 cents, or whatever price can be had for it.

True, the underground reserves are higher today than in the years when such prices prevailed, but they lie in fields where there is no frenzy of development and they are not in the hands of operators who are in there to get out all they can in a hurry. Also the machinery of proration will continue to function unchanged, as far as can be seen now.

This is not to argue that the present crude prices are on bottom. This may not be the case. The ingredients are present for a still lower level to be reached.

Selective buying of crude, the forerunner for months of the general reduction the past week, still goes on. It exists not only as to fields—the hunting of an advantage in one area as against another—but within the posted schedules of major companies. It has been a long time since there was the lack of uniformity in these postings. Each buyer apparently had done considerable checking of its position in the market.

The Mid-Continent schedules, for instance, with some companies were cut a straight 20 cents. With others, through the change in differentials about half way through the gravity schedule—cutting the lower end three cents per degree instead of two cents, as formerly, there was brought about a reduction of as much as 38 cents a barrel on the lowest grade.

In the Gulf Coast, to pick out another example of the lack of uniformity, where some buyers post up to 40 gravity and above at $1.28, others stop at 34 and above, at $1.16 a barrel. Thus, above the 34° grade, some companies are buying for two to 12 cents under prices paid by others.

Analysis Difficult

Comparison only is possible of the schedules in effect today, not analysis. There is a great difference. Analysis is possible only when the quantity of oil of each grade bought by each purchaser is known. There is no way of saying right now what the average price of any important classification of crude is, except in fields like East Texas and others that carry a flat price, or in a single field where the gravity of the oil falls in one bracket.

It is not known, therefore, what is the average price paid by Standard Oil Co. of Indiana or Humble Oil & Refining Co. They buy so many different grades of crude that only a few in the companies know what an average price would be.

Some observers foresee in the situation now at hand a substantial decline in drilling in certain areas. That would be true of Texas, where the market does not stand to absorb much more crude than is now being produced, and in Oklahoma and Kansas, which are substantially in the same position.

May Spur Illinois

In the latter states, further inroads from Illinois are expected and some believe that the price reductions here may actually prove a stimulus to Illinois development and exploration. The move was already underway to get a producing position nearer to the major markets for refined products, where lower transportation rates are a determining factor, and it is expected that the number who are trying

Crude Price Changes In a Nutshell

N. P. N. News Bureau

CLEVELAND, Oct. 18.—Since the cut in the price of Mid-Continent crude oil by all major purchasers, effective Oct. 11, as reported in last week's NPN, the following crude price changes have been announced:

Oct. 11 — Rocky Mountain crude cut 5 to 20.5 cents a barrel. Salt Creek cut 20 cents.

Oct. 12—Kentucky crude cut 10 cents by Stoll Oil Refining Co., Oct. 14 by Ashland Oil & Transportation Co.

Oct 13. — Southern Illinois and Western Kentucky cut 10 cents by Owensboro Corp. and Fordsville Gathering Lines, Inc., respectively, both S. O. Ohio subsidiaries.

Oct. 13—Central states crudes cut 10 to 20 cents by Ohio Oil Co.; Lima, O., Illinois Basin and western Kentucky cut 10 cents and Illinois and Princeton, Ind., grades 20 cents.

Oct. 13—Michigan crude cut 10 to 13 cents.

Oct. 14—Illinois Basin cut 10 cents by Carter Oil Co.

Oct. 15—Santa Maria, Calif., advanced 22 to 25 cents by Union Oil Co.

Oct. 18—Corning, O., cut 10 cents.

Full details on all recent crude price changes will be found in NPN's Crude Price Tables, market section, this issue.

HIGHLIGHTS OF THE NEWS

TULSA—N. P. N. Staff Writer Smith predicts no change in proration policy will follow crude price cuts. Page 9.

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CHICAGO—Next spring is trial date fixed for pending retrials in Madison oil case. Page 18.

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LOS ANGELES—ICC tank truck safety rules shown to conflict with state laws. Page 13.

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TULSA—Opinions differ on effect of crude price cuts on refiners. Page 10.

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WASHINGTON—First wage-hour law rulings issued. Page 17.

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TULSA—U. S. and Louisiana at war over Timbalier leasing. Page 20.

NEW YORK—New York fair trade law upheld as regards gasoline. Page 18.

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CHICAGO—National Safety Council speaker urges that small oil marketing units be brought into safety program. Page 18.

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TULSA—Gasoline tax conference urges $50,000 be set as maximum tax bond. Page 16.

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WASHINGTON—U. S. planning "alky-gas" experiments. Page 12.

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INDIANAPOLIS — Transportation savings are most important factor in oil marketing today, Indiana jobbers are told. Page 11.

to get such position will be increased.

Cheaper drilling, no production taxes, proximity to refineries using large amounts of crude, freedom from state restrictions, all these to be found in Illinois appeal to the producer.

It is not only the producer who is interested. It is known that more than one Mid-Continent refiner, shipping his products by rail to distant markets, has been looking closely at Illinois, sizing up the available crude supply for a new plant.

Concerning the present and what further changes may occur in price: Already, there is disparity in postings of some refiners who own no production with those of major companies in the Mid-Continent. Rock Island Refining Co., Duncan, Okla., went on down another 10 cents, preserving the margin between its prices and those of large purchasers in southern Oklahoma. The Ben Franklin Refining Co., new company which acquired and re-conditioned the old Wirt Franklin Oil Corp. plant at Ardmore, posted a schedule for Healdton and Hewitt crude Oct. 12—its initial posting—two cents below major schedules.

Less Than Majors' Posting

Kanotex Refining Co., Arkansas City, Kans., was 30 cents below the dominant buyers' prices in Kansas and north Oklahoma. The reduction by the majors left it 10 cents under. There are other instances where non-integrated refiners are getting crude at less than the major company postings.

Barnsdall Refining Corp.'s schedule that probably will be posted in the eastern Osage and in Tulsa county, Okla., is under the major companies' schedules. This is a corporation that has no production. Barnsdall Oil Co., the producer, ceased business as a purchaser of oil in the Osage-Tulsa county area the morning of Oct. 15. The refining company has leased the gathering system and pipelines of Barnsdall Oil in the area.

The price schedule offered for the consideration of the producers around Barnsdall, Okla., where the refining company's plant is located, and accepted by them, begins with a posting of 69 cents for below 29 gravity, rises three cents per degree to top of $1.05 for 40 and above. The dominant grade in this area is 33 gravity, for which the price offered is 84 cents, 12 cents under major company postings for the same grade. The grade higher than 33 would be 11 cents under, the grade lower 13 cents under. The 35 gravity bracket would be 10 cents under major prices.

The offer, based on current break-even refinery realizations, as the Barnsdall Refining explained, was accepted by the producers of the 4000 barrels daily involved, but the formality of approval of the Osage tribal council and the Department of the Interior is necessary. There was the possibility that several days would go by before purchases would be resumed.

In the midst of the price readjustment that is going on, what will happen to proration, many ask. There have been some direful prophecies that production control was at the point where it would break up. There is little support for this view. State bodies cannot regulate price, as has been demonstrated and they cannot create markets for more oil than the consumers will take. What they can do is prevent waste, aid in the distribution of markets to all the operators and assist in maintaining a producing policy that will get the greatest possible recovery of oil from the sands. This will continue to be their role.

The fact that members of the Railroad Commission of Texas, in advance of the regular monthly hearing in Austin, intimated that the Saturday and Sunday shutdowns might be abandoned does not mean that proration would be ended in that state, merely that that form of restriction would be. There undoubtedly would result an increase in the allowable production in this state, for much of the Texas production is now on the marginal well basis; there is a law which designates the point below which production of a well cannot be reduced, varying with depth of wells. But the problem of production restriction will be handled, somehow, most oil men familiar with the situation believe. The "lid" is not going to be taken off.

Crude Cut Ups Refiner Margin

N. P. N. News Bureau

CLEVELAND, Oct. 17.—Significance to refiners of the 20-cent cut in Mid-Continent crudes effective Oct. 11 is shown in the advance in the Mid-Continent refiners' operating margin, as calculated in the N.P.N. Refinery Index. From 25.8 cents a barrel on Oct. 3 as last previously reported, the margin jumped to 45.5 cents a barrel the day following the crude cut.

This figure represents the calculated average return from refining a barrel of Mid-Continent 36-36.9 crude. The refinery index as of recent dates is as follows, the figure being in cents per barrel:

Oct. 12	45.5
Oct. 3	25.8
Sept. 1	39.0
Year Ago	59.6

The Oct. 3 figure was the lowest since February, 1932, although the average figure during October, 1934, when crude was $1 a barrel, almost touched this figure. The average index during 1938, before the price of crude was cut, was 36.4 cents a barrel. During 1937 it averaged 56.8 cents. During the past summer the index kept close to the present level.

Views Differ On Refiners' Status on New Crude Price

N. P. N. News Bureau

TULSA, Oct. 17.—Any discussion as to their status under the new crude oil price schedules and present scale of refinery prices in the Mid-Continent, finds refiners there apparently divided into three groups.

One group has the opinion that, as long as the present refinery prices hold, they can just about break even with depreciation included in their costs, and perhaps make a few cents on a barrel of oil processed if the item of depreciation is not considered. In this group will be found a number of the larger integrated companies, particularly those with the most modern refinery equipment.

The second group for some time has contended they have been losing approximately 30 cents a barrel in their refinery operations, and that the reduction in Oklahoma and Kansas of 20 cents a barrel in crude prices still leaves them on the losing side of the ledger.

Then there is the third group, composed at least in part of the all-rail and truck shippers, who have said that, while they may be still slightly in the red or are just breaking even, they definitely are going to operate to make money.

All are agreed on one point—any easing off of the present refined oil prices in the Mid-Continent will throw them definitely in the loss column. They also have the belief in common that the crude cuts last week already had been discounted generally by the trade. The refiners apparently share this opinion with the brokers in this part of the refining territory who said late last week that the market appeared more "settled" than it had for some weeks.

"Live and Let Live"

There are, however, a few refiners in the third group mentioned previously who have sufficient control over their sources of raw material that they can just about make their statement stick that they are going to make money. If the producers from whom they obtain their crude do not sell to these refiners there is no one else to whom they can sell. As a result of this situation there apparently has been a greater tendency in recent months to "live and let live" and it is generally known that in some instances this policy has worked to the mutual advantage of both the producers and the refiners.

A check of the crude schedules in the Mid-Continent in the wake of the recent reductions shows that some of these refiners still are buying their crude supplies at under the postings of the major buyers. There are a few instances in Kansas, three or more in southern Oklahoma and one or two in north central Texas.

Hold Their Advantage

A few of these refiners in past months have given away at least a part of the advantage they enjoyed in lower crude prices, in the course of marketing their refined products in the middle west. This practice naturally has weakened the general refined oils price structure. To the credit of some of the refiners, however, they have not used the advantage they had in raw materials cost to undersell their competition.

The major question now, in the wake of the crude cuts, apparently is what some of these refiners who have found they have the power to dictate within reasonable limits the cost of their raw materials will do in the way of marketing their refined oils during the season of lighter gasoline demand. If they go right on giving away most of their advantage the opinion has been expressed in some quarters that another cycle of crude price cuts is in the making.

Mid-Continent refiners generally are in the fortunate position of not having top-heavy stocks on hand, with the possible exception of bright stocks and, accordingly, they will not have to take as stiff a loss as they might have had they not watched their production and demand closely this year.

Not having to worry too greatly about stocks, the opinion among many of them is that they will be less likely to attempt to meet what competition at under the market prices may develop later in the year. They will be more content to pass up such business and hold only that portion which will yield them a profit.

Shipping Costs Cited Biggest Factor in Today's Marketing

By A. M. PETTY

INDIANAPOLIS, Oct. 13.—Saving on transportation is the most important factor in the marketing of petroleum products in Indiana today, according to Russell S. Williams of Indianapolis, head of the Bonded Oil & Gas System.

Williams was the first speaker on the program of the Indiana Independent Petroleum Assn. meeting here Oct. 12 and 13.

Using a large map of Indiana, Williams emphasized his point that the Hoosier state is hemmed in by refineries, terminals and pipelines. Transport trucks haul into Indiana from all points of the compass, with their routes forming a network virtually covering the entire state, he pointed out.

Many millions of dollars were invested in refineries in the Chicago district, "based on the ability to buy crude in Oklahoma and transport it to the refinery by pipeline." he said.

New factors entering the picture in the last year or so have altered the situation, he added, pointing to new oil fields and refineries in Michigan and Illinois, the tremendously-increased volume of petroleum products moving by water into terminals along the Ohio river and neighboring lake ports and the constantly growing truck movement.

Price Structure Changes

Nominally, the state's price structure is based on railroad freight rates from Group 3 (Oklahoma) but the market has crumbled with some stations selling at 3 or 4 cents under the prevailing posted price on house-brand regular, Williams added.

"Today, there is no means through which prices may be raised—you dare not do anything that might be regarded as price-fixing," Williams said. "And how are you going to ever get an actual market when everyone is quoting off the low of the Chicago Journal of Commerce and the Oilgram?"

He pointed out that there were several thousand retail outlets in the state, owned by the operators who had invested several millions of dollars. Many of these were giving away their margins to hold their gallonage, he said.

Says Majors Urge Price Cuts

"And never before have you had your major competitors trying to get their retail outlets to cut prices," he continued. "There seems to be an organized effort on the part of some majors to get their dealers to cut their price."

Williams warned that if the outcry from the dealers grows loud enough, there might be retaliatory measures enacted by the Indiana legislature against suppliers.

He said that price-selling marketers attempting to maintain an "unduly large" differential below prices posted for major-company brands would be responsible if the dealers' wrath were brought down upon the industry's head.

"Nub of the problem," Williams said, "is that the railroads have ceased to be competitive, not only refusing to meet the competition of gasoline pipelines, barges and transport trucks but, even as late as a few months ago, increasing their rates."

Several ways out of the situation were cited by Williams, including a state fair trade law with suppliers specifying minimum retail prices for their branded gasolines.

Would Endanger Refiners

A general reduction in the price structure to reflect transportation savings was another possibility cited, but Williams pointed out that this would force the rail-shipping independent refiner out of the picture and endanger the investment of marketers in rail facilities.

Real solution, of course, he added, would be a reduction in railroad rates which would level out the price structure but at the same time keep the rail-shipping refiner and his customers in the picture.

Williams was followed by Billy B. Van, mayor of Newport, N. H. and a veteran stage actor who now has become a "sales educationalist." For more than an hour, Van kept in a roar of laughter the 400 oil men who filled every chair and stood around the walls. With dozens of pointed anecdotes, Van drove home his three cardinal points—advertising, display, and salesmanship.

Afterwards the oil men tried their hand at gambling devices, using stage money in a miniature Monte Carlo. Later that evening at the banquet prizes were auctioned off to the heavy winners.

Three speakers were on the next day's program.

'Fear Is Worse Competitor'

Speaking on "Forces That Destroy and Forces That Build Business," Robert M. Bowes of Indianapolis, president of Bowes "Seal Fast" Corp., declared that "fear" was the worst competitor for many marketers.

"Once I was riding in a friend's high-priced car down a Los Angeles boulevard," said Bowes, citing an example of how "fear of the other fellow" destroyed business. "On a corner we were approaching was a service station with a huge sign advertising gasoline at cut prices. To try an experiment, I turned to my friend who was driving and said:

" 'Suppose you need 'gas' in the next few blocks, where would you buy it?' "

" 'Well—I don't know,' my friend replied."

" 'Would you buy it at that station,' said I pointing to the one with price-cut sign."

" 'No, I don't believe I would.' "

" 'Why not,' I asked."

" 'Well, because that station doesn't look like the kind I would want to deal with,' he replied, later saying that it was the price-cut sign which led him to such a conclusion."

"These huge signs you see at many stations," Bowes said, resuming his talk," just shout at all comers—'Cheapskate here's your headquarters.' That's the kind of trade you ask for; that's the kind you get with those signs. You get the customers who use your free air and water, drink your ice water and use your toilets, then turn you down on buying cigarettes because they can buy 2 cents cheaper at the chain drug store."

Cites N. P. N. Survey

Urging the value of "selective selling," Bowes cited the experience of his own company.

"Several years ago, NATIONAL PETROLEUM NEWS—which represents your industry," said

Indiana Elects Huber

INDIANAPOLIS, Oct. 13.—The Indiana Independent Petroleum Assn. elected C. W. Huber of Crown Point, of Crown Point Oil Co., as its president, and re-elected J. Ivan Harris of Indianapolis, Indiana Farm Bureau, vice-president; J. E. Fehsenfeld, of Indianapolis, Crystal Flash Petroleum Co., treasurer; George Hoymayer, Indianapolis, secretary; and J. Malkemus of Louisville, Ky., a director.

New directors elected were: E. A. Dehnbostel, Indianapolis, Quaker Oil Co.; T. C. Pike, Van Buren, Mid-States Oil Co.; and R. J. Stith, Indianapolis, Stith Petroleum Co. (retiring association president).

No resolutions were adopted at this meeting of the Indiana association.

Marketing Begins at Refinery Gate

More and more, oil marketing companies, big and little, recognize today that savings which they can make in transporting their petroleum supplies from the refinery to their own bulk plants and stations mean just as much money in their pockets as savings effected in any other step of marketing operations.

The tremendous recent developments in the truck transporting of gasoline and other oil products, the great expansion of the inland water traffic in petroleum, the strategic moves the railroads are making in an effort to win back some of the oil traffic they have lost to other transportation methods—all these make it more necessary than ever before for all oil marketing companies to keep informed up-to-the-minute on transportation developments which may vitally affect their own businesses.

NATIONAL PETROLEUM NEWS, which follows transportation news closely throughout the year, in its Nov. 9th Annual Transportation Number, will present its summary and interpretations of what recent developments in this field mean to oil marketers everywhere.

The various articles in this issue, prepared by NPN's own editorial staff, will provide a sizeup of the oil transportation situation today which will be of value to all readers and will offer practical suggestions useful in many cases in actually reducing costs.

Extra copies of NPN's Annual Transportation Number are soon exhausted. Readers desiring extra copies should send in their orders at once, at 10 cents a copy.

Bowes, "published results of a survey showing that of the 300,000 or more retail gasoline outlets, 220,000 did only 20 per cent of the total business. That convinced us and we began to go after that comparatively small group which was doing 80 per cent of the business."

Bowes also pointed to a consumer survey by Curtis Publishing Co. which showed that the upper bracket in the income groups accounted for 74 per cent of the total expenditures in the U. S. for automotive equipment.

He reiterated his point that it would pay the marketer to direct his selling efforts at the customer who wants service and expects to pay the full price for it—the customer "who doesn't want to deal with a station which has signs like that."

6.6 Case Explained

H. A. Hollopeter, traffic director of the Indiana state chamber of commerce, was the next speaker. He told of the status of the complaint against the 6.6-pound estimated weight of gasoline, used in determining rail freight rate charges.

Oral argument in the 6.6 case will be held before the interstate Commerce Commission at Washington on Oct. 21, Hollopeter pointed out. As representative of the Indiana association, which was one of the complainants, Hollopeter said he would base his argument on against the 6.6 figure two points, namely:

In 1910, when kerosine (heavier than gasoline) made up the bulk of the tonnage of light refined oils, the weighted-average estimate was 6.8 pounds per gallon for kerosine and gasoline; a 6.6 figure finally agreed upon for rate purposes. Today, with gasoline making up about 44 per cent of the total yield from a barrel of crude and kerosine only 8 per cent, the weighted-averaged shipment is only 6.2 pounds per gallon (which is the figure sought by the complainants as a new estimated weight).

The average gravity of gasoline in 1910 was 49 degrees A. P. I., which figured out to a weight of 6.526 pounds. Today, the average gravity of gasoline is 65 degrees, or a weight of 5.994 pounds.

"As to why the major companies are supporting the railroads' stand on the estimated weight of gasoline," said Hollopeter, "we need go no further than the ICC examiner's report in which he points out that a reduction in the estimated weight would correspondingly reduce pipeline savings and react to the advantage of independents."

Hollopeter suggested that independent jobbers should back the rail-shipping refiners of the Mid-Continent in their complaint, before the ICC, against railroad and pipeline rates on gasoline. Not so many years ago, said Hollopeter, the railroads had a monopolistic viewpoint and took the attitude, "The public be damned."

"Today," said Hollopeter, "I don't know how to describe the railroads' attitude, unless you just say they are *dumb.*"

The program concluded with a brief, humorous speech on "Sleep and Money," by Richard Mills of Indianapolis, Fletcher Trust Co.

7 New Midget 'Poly' Units Are Licensed

CHICAGO, Oct. 17. — Seven companies have recently signed license agreements with Universal Oil Products Co. for the operation of catalytic polymerization units. They will range in capacity from 200,000 to 2,000,000 cubic feet of cracked gas per day. The companies are Northwest Refining Co., Cut Bank, Mont.; Mohawk Petroleum Corp., Mopeco, Kern county, Cal.; Pennzoil Co., Oil City, Pa.; Johnson Oil Refining Co., Cleveland, Okla., and three others whose names are withheld. The total gas processing capacity of these seven units as contemplated is approximately six million cubic feet per day.

Negotiations are continuing with at least six other companies for similar polymerization units, the Universal company states.

Refinery Fire Loss Put at $500,000

NEW YORK, Oct. 14. — The spectacular fire at the Linden, N. J., refinery of the Cities Service Oil Co., which taxed the efforts of about 1500 firemen and plant volunteers for over 18 hours was smothered by foam producing chemicals early Oct. 13.

The fire, which broke out following the explosion of a gasoline storage tank, destroyed 21 storage tanks and about 5,000,000 gallons of various products, it was stated by the company here. Total damage is estimated to be about $500,000. Only one of the firefighters was injured sufficiently to require hospital care.

The blaze was smothered before it spread to the refinery itself, being confined to adjoining storage tanks.

U. S. Study of New Uses for Farm Products Will Include "Alky-Gas"

N. P. N. News Bureau

WASHINGTON, Oct. 17.—Agriculture Department field workers this week began initial draft of their report to Congress on the "four laboratories" to be set up to study new industrial uses for farm products.

It is virtually certain that studies into production of industrial alcohol from farm products for blending with gasoline for use as a motor fuel will be recommended in the report. The Agricultural Adjustment Act of 1938 directed the Department to establish the four laboratories, each in a major agricultural region of the country, "for research on new uses and market outlets for agricultural products." These laboratories are to be financed at a cost of $1,000,000 each per year.

Although the location of the laboratories has not yet been determined the four major areas have been outlined by the department as follows:

Four Areas Defined

Southern: Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Oklahoma, South Carolina and Texas.

Eastern: Connecticut, Delaware, Kentucky, Maine, Maryland, Massachusets, New Hampshire, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, Tennessee, Vermont, Virginia and West Virginia.

Northern: Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, the Dakotas, Ohio, Wisconsin and Michigan.

Western: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.

Initial studies in all the laboratories will be concentrated on certain specified crops and their possible by-products. It is significant to the petroleum industry, that in each area, at least one potential alcohol crop has been designated.

The field investigators who are now compiling their report to Congress have been visiting state and industrial laboratories over the entire country all summer to check up on existing research into the new uses for farm products.

In a great many of their talks with technical men over the country, the regional investigators have discussed "alky gas," and it seems that the demand for some research into this will be sufficient to make some federal studies inevitable.

The work of the laboratories will not be all "test tube" experimentation. Once a process has developed as a test-tube process, the laboratories will probably attempt to develop it, if found economic on an industrial scale—thus, while the laboratories will be primarily chemical laboratories, they will also go into the engineering possibilities, and the economic soundness, of the industrial uses which they may develop.

Calif. Natural Gasoline Meet Talks Announced

N. P. N. News Bureau

LOS ANGELES, Oct. 15. — A program of specific and general appeal, not only to engineers engaged in the natural gasoline field but to engineers and chemists in all branches of the oil and gas industry, has been prepared for the 13th annual fall meeting of the California Natural Gasoline Assn. in Los Angeles Nov. 4.

The full day's technical session, will culminate in a banquet and entertainment scheduled for the evening, H. R. Linhoff, president, announced.

At the morning session, following opening remarks by the president and a report by the technical committee of problems affecting the natural gasoline industry, technical papers will be presented as follows:

"A New Molecular Test for Absorption Oils", by D. B. Johns.

"A Hydrometer Test Applied to Liquefied Petroleum Gases", by W. M. Schaufelberger.

"Advance in Design and Operation of Compressor Plants", by T. Hume West.

The afternoon session, beginning at two, will offer the following talks:

"Pressure Maintenance or Saving of Reservoir Energy in Connection with the Production of Oil as Practiced by Mid-Continent Operators", by Stanley Herold, consulting engineer.

"Possibilities and Limitations of the Production of Oil Under Pressure Maintenance from California Fields", A. C. Rubel, Union Oil Co.

"Effect of Pressure Maintenance on Gasoline Plant Design", by Henry N. Wade, Parkhill-Wade, consulting and construction engineers.

"Possible Utilization of Lighter Hydrocarbons such as Ethane, Propane, and Butane for the Production of Chemicals", by Prof. Robert E. Vivian, of the University of Southern California.

Show ICC Truck Regulations In Conflict With State Laws

N. P. N. News Bureau

LOS ANGELES, Oct. 15.—Making the first public attack on the Interstate Commerce Commission's proposed motor carrier safety regulations, principal west coast oil marketing companies, while admitting the need for "reasonable" uniform motor truck regulation, refused to admit jurisdiction of federal authorities in the imposition of such regulations.

In Los Angeles, Oct. 10 and 11, was held the first of a series of hearings on the proposed regulations, which may eventually put all motor carriers, including common, contract and private, under federal control, through the prescribing of "safety" measures for their operation because of the flammable nature of the loads they carry.

At this hearing, at which was discussed the proposed federal safety regulation of common and contract motor carriers engaged in interstate and foreign transportation of explosives and other dangerous articles (including gasoline and liquefied gases) and to determine the "need" for extending such regulation to private carriers, ICC representatives were told that they were performing a distinct service in formulating regulations which could be used as a model in the preparation of state laws. However, they were told that only the state laws should govern the operation of privately owned trucks. Oil marketers represented at the hearing conceded that there was a need for uniform regulation, to the end that special designs and facilities would not be required to meet a variety of rules set up by the various states.

Oil Companies' Position

The oil companies' stand at the hearing, of urging the use of the proposed regulations as a model in the preparation of state laws, was declared in line with the avowed objective, outlined by the Interstate Commerce Commission two years ago, to assist in establishing regulations, which would serve as an example for state authorities.

Oil company representatives at the hearing, without conceding ICC jurisdiction, offered suggestions for changes in the proposed federal law as an aid "in establishing a standard for uniform regulations which the states might adopt and which would be practicable for the petroleum industry as well as a help toward public safety."

Robert M. Searls, representing the California Oil and Gas Assn. and its membership of California oil companies, headed opposition by the west coast industry to the need for ICC regulation of private carriers, and directed the examination of oil company experts as they suggested modification of the proposed regulations in the light of experience and operating methods in that area.

It was clear from the outset that California oil companies represented at the hearing, and in fact common and contract carriers, felt that many provisions in this 600-page ICC proposed third draft of regulations would seriously conflict with regulations now existing in some western states and would impose restrictions not applicable to operations in this area.

Would Increase Costs

Although not openly stated, the inference was drawn by one oil company witness that several provisions were obviously directed toward increasing costs and reducing the pay-load of motor carriers. Much of the direct testimony by oil company experts sought to show the fallacy of certain parts of the regulation and to urge modification in line with actual experience.

Turner C. Smith, structural engineer in charge of pressure vessel design for the General Petroleum Corp., offered recommendations for changes in the section of the proposed regulations pertaining to compressed gases.

One of the most important recommendations by this witness was that recognition be given to the API-ASME code for Unfired Pressure Vessels for Petroleum Liquids and Gases 1938 Edition, under which most of the tanks used by motor carriers of liquefied gases in Pacific Coast states have been built.

The proposed regulations would permit only tanks built in accordance with requirements of the ASME code for unfired pressure vessels, 1937 edition, and Smith suggested that certain sections of the API-ASME code be included as an alternate.

Smith pointed out that motor carrier pressure tanks constructed according to this latter code have been found satisfactory in California where a large part — probably two-thirds — of the nation's bulk business in liquefied petroleum gases (butane-propane mixtures) is handled.

Would Force Replacements

Although they conform to the rules of this code and have given evidence of their adequacy for the service, Smith declared these tanks could not be given sufficiently high pressure ratings under the ASME code to continue in service.

"Replacement would be forced due to a difference in code requirements rather than because of any weakness or deficiency affecting their safety," he said, adding that failure to recognize the API-ASME code would result in confiscation of most of the tanks now in service in this area.

The proposed ICC regulations would require re-rating existing tanks built under this code according to the ASME code. Due to the percentage volume of business handled in California, this involves two-thirds of the existing truck tank capacity for this service in the country, Smith said.

He declared pay-loads of tanks would be reduced by heavier construction, at no appreciable increase in the factor of safety. Under the ASME code, a truck tank of maximum capacity would have only one-third of its weight in payload. The API-ASME code would permit a 20 per cent increase in this payload.

Lettering Discussed

Among many others, the question was raised as to why 2-inch letters should be required to mark inflammable liquid tanks and 1¼-inch letters on corrosive liquid tanks. James C. Bennett, manager of the automotive department, Associated Division, Tide Water Oil Co., pointed out that oil companies spent very substantial sums of money in the finish of distributing tank trucks and that additional lettering would detract from the advertising appeal of this equipment.

Several witnesses voiced the opinion that the public would be thrown into consternation by truck markings denoting "explosives," "acids," and other so-called dangerous articles, and feared a hue and cry would be raised to remove such carriers from the highways.

Exception was taken by one witness to the "outage chart" which accompanies the section in the proposed regulation on "loading."

Outage Discussed

The section reads that the outage in a cargo tank or each compartment used in the transportation of inflammable liquids exceeding 100 miles shall not be less than 2 per cent of its volume, and in any case the free space or outage shall not be less than one per cent. The outage chart then provides for outages ranging from 2 to 5 per cent, depending upon the liquids coefficient of expansion and its loading temperature. Elimination of the chart was "strongly recommended."

In support of this stand, the oil companies offered in evidence test data accumulated during the past summer under actual transport operating conditions on runs between the Los Angeles Basin, Imperial Valley, and Southern Arizona. This area

(*Continued on page* 24)

Tax Diversion Causes Deaths, Truckers Hold

DETROIT, Oct. 18.—That gasoline tax diversion has a direct effect on deaths through motor vehicle accidents is to be emphasized at the fifth national convention of the American Trucking Assns., Inc. opening Oct. 31 at Detroit.

The organization has compiled data showing that two-thirds of the states in which the motor vehicle death rate exceeds that of the country as a whole are states in which gasoline tax diversion is practiced. Narrow, winding roads, sharp curves, steep grades, and similar conditions dangerous to human life can only be removed by the full expenditure of the money raised through gasoline taxes, the truckers' association holds.

It also maintains that there is only one justifiable excuse for taxing gasoline and that is to build roads; and that if roads are not to be built with motor fuel revenue, the tax should be repealed.

It calls attention to the constitutional amendments prohibiting diversion which will be voted upon this fall in Alabama, California, Michigan and New Hampshire.

Among the prominent speakers at the truckers' convention will be W. J. Cameron, Ford Motor Co., and Paul G. Hoffman, Studebaker Corp.

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Destructive Oil Tax Would Be "Gospel of Jesus", Says Roger Babson

By WARREN C. PLATT, Editor

For all of a long, industrious and outstanding constructive business life, Roger Babson, probably this country's pioneer leading economist, has urged business men to study facts. To help the American business man to do a good job of such fact studying, Mr. Babson has built a large and profitable business in supplying facts and in teaching business men how and why to study them.

But at Boston the other week, he stepped aside from his preaching and his custom on behalf of getting and considering facts. Before the Chamber of Commerce there he urged, as a means of reducing unemployment, the levying of excessive taxes on oil and other natural resources; not only to get half the cost of all relief work from such taxes but, in connection with oil, in order to reduce its production of petroleum products so that at least 20% of the country's motor fuel could be made from farm grown alcohol, which, he said, would "immediately" put 50,000,000 acres of farm land to profitable use.

As a clincher to put over his plan, Mr. Babson, leading churchman that he is, demanded the taxes in the name of the Almighty and called on the churchmen of the country to support him, in this idea.

We could not believe our eyes. Had we not read the statement in a copy of his speech sent us by his vice president from his own office, we would have believed some one was trying to perpetrate some sacrilegious joke on the oil industry.

Many people have leveled all sorts of attacks at the oil industry for both taxes and for seeming commercial advantages, but this is the first time to our knowledge where any one undertook to commercialize the Gospel of Jesus and the Golden Rule to put over commercial ideas, let alone ideas so fallacious as the ones espoused in this case. Mr. Babson must be catching some of the contagion from the various Townsend and $30-Every-Thursday, rackets that appeal to sentiment and some one's pocketbook, but nevertheless violate reason.

Declaring his points "would be a practical application of Jesus' Gospel and the Golden Rule," and calling on brother churchmen by saying, "certainly, this is a program which the churches should endorse", Mr. Babson states that a third of the country's 9,000,000 unemployed employables, are idle because of;

"1. Our change of motive power from horses, which consumed oats and hay raised annually by labor, for gasoline obtained almost freely from the earth.

"2. Our change of industrial power from bituminous coal, which was mined by labor and hauled by trains, for temporarily cheap fuel oil which flows through pipes.

"3. Our change of heating from anthracite coal, which also gave employment to those taking care of furnaces, ashes etc., for the carefree oil burner."

Then Mr. Babson notes rayons and alloys and includes; "Other temporary substitutions such as gasoline for sail power, tar for gravel, farm tractors for mules and forest products for leather."

The tax, he recommends "should be sufficient to cover 50 per cent of the WPA and other relief expenditures." "The tax," he says, "will be needed until the oil begins to give out."

"If the internal combustion engine, the oil burner, cotton roads, sweet potato chemistry and similar inventions were like the power loom—merely making labor more efficient—I would not suggest taxing them," he says.

Mr. Babson figures that, if 20% of the oil consumed could be saved and the deficit in motor fuel consumption be made up from grain alcohol, 50,000,000 acres of farm land would go into profitable production.

Then, evidently fearful to have these facts stand alone for lay criticism in a common sense way, Churchman Babson, like an avenging Puritan of his own New England, declares his statements a part of Christ's Gospel and of the Golden Rule.

One does not know whether to laugh, at this pompous nonsense or to get mad and condemn him for running to mankind's Greatest Belief as sanctuary from his fallacious and ill-considered talk.

The economic havoc that would be wrought by the adoption of Mr. Babson's ideas are terrifying to even contemplate. That the internal combustion engine is any less of a labor saver than the power loom, is untenable. The two go together in reducing the number of human hands needed per square foot or pound of product and in increasing the number of uses the product can be put to.

That gasoline is obtained "freely" from the earth is subject to many qualifications. We have no measuring figures at hand but a mind's eye view of the producing end of the oil industry with its hundreds of thousands of workers and the army of auxiliary workers in allied lines, gives us a little different picture than the one that Mr. Babson would have us contemplate of a farmer busily viewing a pasture where grazes a mule.

As to the competition of oil with coal for steam raising and heating purposes, there are some improvements that people today will not give up, no matter who demands it, as CIO Coalman Lewis discovered when he tried to tax oil out of use and send Mother back to the cellar to shovel the coal and ashes that his men presumably might mine.

If by chance Mr. Babson got a tax levied on natural resources to pay half the relief cost today, that undoubtedly would cost the oil industry several billion dollars more a year, calling for an *additional* gasoline tax say, of 10 cents or perhaps even more per gallon. Mr. Babson should know that perhaps an additional dime per gallon might wreck the markets for any kind of fuel, whether from petroleum or from grain.

And all this nonsense for the return of the high cost hardships of primitive days, Mr. Babson says is "a practical application of Jesus' Gospel and the Golden Rule."

In so saying, Mr. Babson, economist and great business teacher, turns his back on all that he has taught both in business office and in church.

Coal's 'Horning In' Gas Pipeline Case May Decide Policy

N. P. N. News Bureau

WASHINGTON, Oct. 17. — Federal Power Commission has ordered oral arguments on the question of the coal industry's petitions to intervene in the case arising out of application of Kansas Pipe Line & Gas Co. to build a natural gas pipe line from Kansas to the Minnesota iron range.

Hearing will be held here October 21. Petitions to intervene, and, of course, to present testimony in opposition to granting the application, have been filed by the National Bituminous Coal Commission (a federal government agency), National Coal Assn., United Mine Workers of America (C. I. O. affiliate headed by John L. Lewis), the Northwestern Coal Dealers Assn., and the Maher Coal Bureau (N. P. N. Oct. 5, p. 12, and Sept. 28, p. 20).

Future policy of the commission in its dealings with the natural gas industry, over whose activities it was given control by the Lea natural gas act passed by the last session of Congress, will be determined in large part by this case it is expected. Particularly the part which disgruntled coal interests will be allowed to play in deliberations preceding determination of "public convenience and necessity" for establishment of new natural gas lines.

Points Outlined

In announcing the oral argument, FPC said it will cover the following questions:

"1. Whether the petitioners (coal interests) are competitors of the Kansas company within the meaning of Section 15 (a) of the Natural Gas Act and as such should be permitted to intervene in the proceeding;

"2. Whether, and if so, to what extent, the participation of the petitioners in this proceeding will be in the public interest;

"3. Whether the Natural Gas Act requires or contemplates that the commission, in determining the question of public convenience and necessity in this proceeding, shall consider the effect which the construction or extension of facilities by a natural gas company and the service of natural gas thereby, will have upon persons directly or indirectly engaged in the business of producing or distributing a fuel other than natural gas."

Meeting Date Set

OIL CITY, Pa., Oct. 18.—The 16th annual meeting of the Pennsylvania Grade Crude Oil Assn. will be held June 15 and 16, 1939, at Hotel Hershey, Hershey, Pa., according to the Penn Grade Bulletin.

Making Anti-Trust Laws Work Subject at Jobber Convention

N. P. N. News Bureau

WASHINGTON, Oct. 18.—The application, or lack of application of the federal anti-trust laws, in the oil marketing industry will be the theme of the annual convention and trade exhibit of the National Oil Marketers Assn. at the Morrison Hotel, Chicago, Oct. 24 and 25.

"The topics of the speakers are all very timely in view of the thorough investigation about to start in Washington by the Monopoly Investigating committee," stated Paul E. Hadlick, secretary of the organization, from its headquarters here.

A trade exhibit of equipment, supplies and services used by oil jobbers will be staged in conjunction with the convention.

The morning session Oct. 24 will be devoted to the annual address of the president of the association, Roy R. Fisher of Detroit, head of the Argo Oil Co., and the report of Secretary Hadlick. Convention committees will be appointed and there will be discussion and comments from the floor by independent oil jobbers.

In the afternoon an address will be given by Wendell Berge, chief assistant to Thurman Arnold, head of the anti-trust division of the Department of Justice, and Arnold's alternate on the Monopoly Investigating Committee. His subject will be "Making the Anti-Trust Laws Work." The election of directors from state groups will also take place at this session.

The morning session Oct. 25 will be taken up with a speech by William J. Kemnitzer, petroleum economist and author, on "The Principles of and Abuses in Petroleum Trade".

At the afternoon session, James F. Lawrence, Tulsa traffic attorney, will talk on "The Cause and Cure for Independent Oil Men's Troubles."

B. W. Ruark, general manager of the Motor and Equipment Wholesalers Assn., will give an address on "Smash Monopoly, Save Democracy." The report of the convention committees will be made at this final session.

Oil's WASHINGTON CALENDAR

Below are given the dates and notices of hearings, proceedings, new legislation, etc., which are of importance to oil companies. Notice is also given of regulations issued, interpretations of laws, new publications etc., with information as to how readers may secure official copies of these.

Oct. 21.—Oral argument before Interstate Commerce Commission on Docket No. 27682, the 6.6 pounds estimated weight of gasoline case, in which a number of oil companies and marketing associations are seeking to change the estimated weight used in determining railroad freight charges.

Oct. 21—Hearing before Federal Power Commission on petitions from coal interests to prevent building of a natural gas pipeline by Kansas Pipe Line and Gas Co., from Kansas to Minnesota.

Oct. 21—Opening of bids by Treasury Procurement Division to supply government requirements of fuel oil in Regions 1 and 3.

Oct. 24—Effective date of the Fair Labor Standards Act of 1938 (federal wage-hour law).

First interpretative bulletin entitled "General Statement as to the coverage of the Fair Labor Standards Act of 1938," has been issued through Administrator Andrews. For copies write Elmer F. Andrews, Administrator, Wage and Hour Division, Department of Labor, Washington, asking for it by name and giving release number 62. Another release on the regulations governing exemptions granted to "learners, apprentices, messengers and handicapped workers" has been issued; its release number is 70.

Copies of the act itself may be secured from the Superintendent of Documents, Washington, D. C., by sending five cents in cash (no stamps). (See article this issue, page 17.)

Oct. 24—Opening of bids by Treasury Procurement Division to supply government requirements for gasoline in Regions 2 and 4.

Oct. 26—Hearing originally set for this date before the Bureau of Motor Carriers, Interstate Commerce Commission, on proposed safety regulations for truck transporting of petroleum products and other flammable and explosive materials postponed to Nov. 21. (See article, page 13.)

Oct. 26—Opening of bids by Treasury Procurement Division to supply government requirements for gasoline for Regions 1 and 5.

Oct. 28—Opening of bids by Treasury Procurement Division to supply government requirements for gasoline for Regions 3 and 6.

Nov. 6 and 7—First hearings by the Federal Power Commission, under the Lea Natural Gas Act, providing for authority to regulate natural gas transportation. Hearing on the application of four Texas natural gas companies to export gas to Mexico.

Nov. 9—Hearing before Interstate Commerce Commission in the reopened crude pipeline rate case (Docket 26570).

Dec. 1—Hearing before an Interstate Commerce Commission examiner at Memphis, Tenn., on railroads fourth section application to reduce rates to Alabama points on the Tennessee River from the New Orleans-Baton Rouge Group, without corresponding reductions from points west of the Mississippi River.

New Bulletins

"Studies Pertaining to the Catalytic Hydrogenation of Pyrolitic Tars," U. S. Bureau of Mines Technical Paper 587 by H. M. Smith, Harry T. Rall and Peter Grandone. Pertains to utilization of waste tar from natural gas. Apply Superintendent Public Documents, Washington; send 10 cents.

Oil Burner Institute Head Retires

NEW YORK, Oct. 17.—G. Harvey Porter, managing director of the Oil Burner Institute since July, 1935, has resigned from the Institute effective Oct. 31.

Porter explained that he had been contemplating the step for some time because of demands of other interests with which he has been closely associated during the past 20 years. He said his co-operation in Institute affairs would undoubtedly be continued from time to time through his close interest in the oil heating industry.

$50,000 Set As Maximum For State 'Gas' Tax Bond

N. P. N. News Bureau

TULSA, Oct. 15. — A $50,000 maximum bond for gasoline marketers, to guarantee payment to the state authorities of the motor fuel tax monies they collect from their customers, was approved by the North American Gasoline Tax Conference, at their annual convention here Oct. 10 to 14. Delegates were representatives of the states' gasoline tax collection agencies.

A bond of this maximum amount was considered as adequate protection, in the opinion of representatives from several states. A resolution was adopted by the conference recommending that, where necessary, the state laws be amended to specify $50,000 as the maximum called for in bonds to be taken out by gasoline marketers.

It was pointed out at the conference that, in some cases, bonds considerably in excess of that amount had been required, making the furnishing of bonds an expensive item for some distributors.

State Bonds Vary

Over the country, the average bond required from gasoline distributors is said to run from a minimum of $1000 to a maximum of between $20,000 and $25,000. Generally the bonds for performance in the payment of gasoline taxes collected are required by law. In a few states they are at the discretion of the tax commissioner and it is here, in some cases, that oil companies are required to pay for an exorbitant bond.

Another resolution adopted by the conference calls for all state gasoline tax administrators to make every effort to report promptly and thoroughly all shipments of petroleum products from their own states to states to which they are assigned. Such co-operative reporting has been done for some years by several of the tax administrators and has been found to aid in checking attempts to evade the state gasoline taxes.

The conference adopted a committee report presented by C. C. Brown, Oklahoma Tax Commission members, in which the abolition of tax refunds and exemptions was urged, except in the case of the federal government. The report offered the following five measures for checking and eliminating gasoline tax evasion:

Five Measures Offered

1. That all states should provide for a refund of motor fuel taxes on motor fuel used for purposes which make it nontaxable rather than permitting exempt purchases.

2. That each state provide licensed distributors with serially numbered invoices, distributors being held responsible for each invoice.

3. That any person buying motor fuel on which a refund claim will be filed must demand a copy of the invoice.

4. That the state provide blank forms setting forth information to assist the collection agency in determining validity of the claims.

5. That no refund claim shall be approved for payment by any state collection agency until the distributor has made an affidavit that the tax has been collected from the purchaser.

Two of the featured papers at the conference were given the morning of Oct. 13 by Joseph L. McLaughlin of the New Jersey division of motor fuels at Trenton, and a past president of the organization, and by Gen. Baird H. Markham, director of the American Petroleum Industries Committee, New York.

Price Law Discussed

McLaughlin's subject was "Retail Station Control", in which he discussed the law regulating the retail sale of motor fuel recently placed in effect in New Jersey.

"No administrative or supervisory additions have been necessary and all personnel is working on both tax and control work, although separate payrolls exist," McLaughlin said. "However, as for settling the big problem of the retail dealer, that of making a suitable profit, I am afraid that they have not found its solution by the control act. It is human to promise to keep the sale price of gasoline at a certain level, but still more human to break such promise when one's own pocketbook begins to suffer.

"With the further ever present need, on the part of all concerned, the suppliers, dealers, ourselves, of being constantly on guard to avoid any appearance of price collusion or price agreement, more difficulty is encountered. Whatever the outcome, we are proceeding with the administration to the best of our ability."

General Markham told the tax collectors that honest and effective administration of gasoline taxation must be maintained to the letter.

Against All Diversion

"Gasoline tax administrators and oil men have much in common," General Markham continued. "With the taxpayers we are pioneering in what is, to this country comparatively a new field of taxation — one which involves levies upon sales of commodities. Any gasoline tax levied in the U. S. is imposed upon the principal income product of the petroleum industry. It is a tax which that industry must collect, largely at its own expense, and which greatly increases the cost of the commodities it sells to its customers.

"The petroleum industry, regardless of its desire, is forced to maintain a close interest in gasoline taxation. It is equally interested in gasoline tax administration, which has direct effect upon the industry's business. Permit tax administration to relax and almost automatically a situation is created which can wreck the gasoline business over a wide area.

"The petroleum industry insists that gasoline shall be taxed once only, and then by the states; that revenue derived from a tax imposed for the specific purpose of financing highways should be used for no other purpose whatsoever."

Delegates to the tax conference were entertained the last day of their meeting by a barbecue picnic at the "Woolaroc" ranch, near Bartlesville, Okla., of Frank Phillips, of the Phillips Petroleum Co.

New Officers of 'Gas' Tax Conference

TULSA, Oct. 17. — Officers for the coming year of the North American Gasoline Tax Conference, elected at the annual meeting here of the conference are as follows:

President — George H. Sheppard, Austin, Texas, state comptroller.

Vice president—Leo J. Wegman, Des Moines, Ia., state treasurer.

Secretary — Howard Dyer, Jackson, Miss., member of the Mississippi motor vehicle commission.

Treasurer—Dixwell L. Pierce, Sacramento, Calif., member of the state board of equalization.

Minneapolis was selected for the 1939 convention.

Oil Credit Men Plan Conference

ST. LOUIS, Oct. 10.—An effort will be made to acquaint the newcomer in the petroleum refining industry with credit problems covering the whole range of jobber and distributor to household and farmer accounts at the annual conference of the Petroleum Refiners Division of the National Assn. of Credit Men, according to E. R. Siler, Socony-Vacuum Oil Co., Inc., Lubrite Division, and chairman of the board of governors of the association. The conference will be held at the Indianapolis Athletic Club, Indianapolis, Oct. 24, 25 and 26.

Fundamental credit problems will be discussed in roundtable fashion, tackling jobbers and distributors, dealers, lessee-dealers, fuel oil, household consumer, farmer and credit card accounts.

Results of the national credit card survey made by the association will be announced for the first time during the conference.

At the annual banquet, two speakers will appear. They are Henry Heimann, executive manager of the national association, New York, and Carl Wilde, southern Indiana referee in bankruptcy, who will talk on the new Chandler Bankruptcy act which went into effect Sept. 22.

Asphalt Highway Builders Confer

BILOXI, Miss., Oct. 13.—More than 500 registrations made the Fourth Montana National Bituminous Conference held here Oct. 10 to 13 the largest in the history of that organization. Thirty-eight states, Canada, Mexico and Argentine, South America, were represented.

The program this year was devoted almost entirely to engineering problems in connection with construction of roads with asphalt and road oil. The materials as supplied by the petroleum industry apparently were recognized as satisfactory and the discussion centered around the proper methods of applying them to road beds, the proper aggregate and the proper soil stability to be employed and the progress that has been made in road construction. With the program so arranged it was primarily a meeting for road engineers.

The Western Petroleum Refiners Assn. of Tulsa and the Mississippi Highway Department joined with the Montana Highway Department in sponsoring the meeting.

First Wage-Hour Rulings Are Issued at Washington

N. P. N. News Bureau

WASHINGTON, Oct. 18. — The federal wage-hour law does not become effective until Oct. 24 but already officials administering it have in mind plans for securing enactment of state wage-hour laws to supplement the federal statute.

Elmer F. Andrews, wage-hour administrator, revealed at his press conference today that he would appeal to all "intrastate" employers (not within scope of the federal law) to voluntarily comply with the maximum hours and minimum wages of the new law "until we can get some state laws enacted."

Asked what an employer was to do who didn't know whether or not his operations came under the law, Administrator Andrews replied:

"Best thing for him to do is let his conscience be his guide — observe the prescribed wages and hours. It wouldn't be a national catastrophe if an employer complied with the wage-hour law and then found out later that he was not under the law."

Prescribing Records

Andrews also disclosed that, in a few days, the wage-hour administration would issue a statement on the type of records which will have to be kept by employers, a statement on "administrative, executive and professional employes" who are exempt from the law, and another statement on "seasonal industries."

From the declared policy of Congress at start of the law, said Andrews in the first interpretative bulletin issued last week, "it is evident that, apart from certain specific exemptions enumerated later in the statute, Congress intended the widest possible application of its regulatory power over interstate commerce; and the Administrator, in interpreting the statute for the purpose of performing his administrative duties, should properly lean toward a broad interpretation of the key words, 'engaged in (interstate) commerce or in the production of goods for (interstate) commerce.'"

Whether a particular employe is under the law or not is an individual matter depending on the nature of the employment of the particular employe, Andrews added.

"Some employers in a given industry may not be subject to the act at all," Andrews continued. "Other employes in the industry may be subject to the act in respect to some of their employes, and not others; still other employers in the industry may be subject to the act in respect to all their employes except those specifically exempted (by the law)."

Cites Examples

Andrews then gave some instances of employes who are included under the law, but emphasized that these instances were "typical but not exclusive." In other words, Andrews listed some types of operations which he regards as clearly under the law, but pointed out that this enumeration does not mean that other employers in the same industry, with slightly different operations, will not be included under the law by a later ruling.

In the category of workers "engaged in (interstate) commerce" the law applies to employes in the telephone, telegraph, radio and transportation industries, "since these industries serve as the actual instrumentalities of interstate commerce. Employes who are an essential part of the stream of interstate commerce are also included in the phrase 'engaged in commerce': for example, employes of a warehouse whose storage facilities are used in the interstate distribution of goods.

"The second category of workers included — those engaged 'in the production of goods for (interstate) commerce', applies, typically, but not exclusively, to that large group of employes engaged in manufacturing, processing, or distributing plants, a part of whose goods moves in commerce out of the state in which the plant is located."

Applied To Oil

Applying these two statements to the oil industry, it would seem that "manufacturing" or "processing" plants would cover refineries, natural gasoline manufacturers, compounding plants, grease manufacturers and blending plants where some of the product moves out of the state; the term "distribution plants" would probably cover terminals and bulk plants, from which deliveries are made out of the state.

But, as Administrator Andrews has indicated, such statements are not exclusive; there is no inference that terminals and bulk plants, from which deliveries are confined to the bounds of one state, will not be declared under the law in a subsequent ruling. In these rulings, Andrews has ruled that *shippers* in "interstate commerce" are under the law; the next rulings may turn the other way, that is, they may hold that terminals and bulk plants *receiving* goods in "interstate commerce" are under the law.

To continue with an analysis of Andrews' statement — the wage-hour administrator said that application of the law to such employers, as listed in the two categories above, is "not limited merely to employes who are engaged in the actual physical work on the product itself." He cited the provision about employes whose work was "necessary to the production thereof."

"Therefore," Andrews added, "the benefits of the (wage-hour) statute are extended to such employes as maintenance workers, watchmen, clerks, stenographers, messengers, all of whom must be considered as engaged in processes or occupations 'necessary to the production' of the goods."

Except for the special exemptions in the law (such as administrative employes, farm workers, and classes exempted) "all employes in a place of employment, where goods shipped or sold in interstate commerce were produced, are included in the (law's) coverage, unless the employer maintains the burden of establishing, as to particular employes, that their functions are so definitely segregated that they do not contribute to the production of the goods for interstate commerce as these terms are broadly defined in the act," the wage-hour administrator said.

Andrews went on to say that the law does not apply to plants "where the employes work on raw materials derived from within the state and where none of the product of the plant moves in interstate commerce."

"This is true," he added, "even though the product so manufactured and sold locally comes in competition with similar products which have been manufactured elsewhere and have been moved in interstate commerce."

Concluding the first interpretative bulletin, Andrews said:

"The act is not limited to employes working on an hourly wage. The requirement of Section 6 as to minimum wages is that the employes must be paid *at the rate of* not less than 25 cents an hour (the rate is stepped up in succeeding years). This does not mean that employes cannot be paid on a piece-work basis after October 24; it merely means that whatever the basis on which the workers are paid, whether it be monthly, weekly, or on a piece-work basis, they must receive at least the equivalent of the minimum hourly rate. Rules and regulations to be prescribed by the Administrator will provide for the keeping of records in such form as to enable compensation on a piece-work basis to be translated into terms of an hourly rate."

In another ruling, Andrews declared that, even though Congress could have made the wage-hour law applicable to even "local" employers in the District of Columbia, the legislators did not do so. Therefore, employers, whose business is entirely within the District of Columbia and doesn't involve any "commerce" with any state, are exempt from the law.

Reader's Service On Wage-Hour Law

First official interpretations on the Fair Labor Standards Act (federal wage-hour law) have begun to trickle out of the Wage-Hour Division of the Department of Labor at Washington. So far, none apply specifically to operations in the oil industry. An accompanying story analyzes these first wage-hour interpretations; others are expected in a few days.

Several hundred readers have written in to NATIONAL PETROLEUM NEWS, requesting official copies of the wage-hour law with many asking questions about its possible application to their operations. NPN has supplied all these readers with copies of the law without charge, but this supply of free copies is now exhausted.

NPN has purchased additional copies from the Government Printing Office, however, and will be glad to supply any reader desiring official copies of the law at five (5) cents per copy (which is the price charged by the Government Printing Office for single copies).

Please direct all requests for copies of the law with payment in stamps at 5 cents each enclosed and for information concerning the law to NATIONAL PETROLEUM NEWS, 1213 West Third St., Cleveland, Ohio.

NPN Question Box On Wage-Hour Law

CLEVELAND, Oct. 17.—Here are some typical questions about the Fair Labor Standards Act (federal wage-hour law) asked by readers of NATIONAL PETROLEUM NEWS with NPN's "best guess" as to the answers where there have been no official rulings:

Question: Is a night watchman under the maximum hours provision of the law? How about clerical help?

Answer: The wage-hour administrator has ruled that, where the employer is under the law, the wages and hour provisions apply to night watchmen, stenographers, maintenance workers and clerks.

Question: Do employes of a drilling contractor, paid by the hour, whose work fluctuates, come under the "seasonal" exemption? How about the "interstate" character of such work?

Answer: A statement by wage-hour officials on the exemption for "seasonal" industries is expected within a few days. One wage-hour official expressed the opinion—entirely unofficially—that drilling contractors were "intrastate" operations and so exempt from the law.

Question: How about an employe working 10 hours a day whose monthly rate of pay figures out to more than the minimum hourly rate (25 cents), plus time-and-a-half for the "overtime" hours in excess of 44? Can he work the same number of hours if paid the same monthly compensation?

Answer: Longer hours than the basic "maximum" of 44 per week can be worked, provided the "employe receives compensation for his employment in excess of the hours above specified (44 for the first year) at a rate not less than one and one-half times the regular rate at which he is employed."

While the law states that the employe is to be paid one and a half times the "regular rate" there is nothing in the law to prevent an employer from adjusting the employe's "regular rate" of pay to an hourly basis which would be in excess of the minimum hourly rate plus time-and-a-half for overtime. This could be done without reducing the employe's total monthly compensation.

Question: We have on one truck driver who drives transports from Jacksonville, Fla., to our bulk plant at ....., Georgia; how will the wage-hour law affect him?

Answer: The wage-hour law specifically applies to trucks, which are subject to the Interstate Commerce Commission under the Motor Carrier Act as regards hours-of-service; privately-operated trucks come within the ICC's jurisdiction as regards drivers' hours, where the operation involves "interstate commerce." There is no question but that the driver of a truck hauling from Florida into Georgia is in "interstate commerce." So, he is subject to the minimum wage provision but is exempt from the maximum hour provision of the wage-hour law. (See fuller discussion of this point in N.P.N., Sept. 28th issue.)

Question: What about men employed at a river terminal engaged in unloading gasoline from barges? How about truck drivers hauling out of this terminal?

Answer: Wage-hour officials have not ruled on the status of terminals and bulk plants receiving goods from out of the state. Our "best guess" is that officials will eventually hold that the "stream of commerce" doesn't end at least until the gasoline has been unloaded into storage tanks; and they may go further and consider it as "flowing" through the storage tanks and into the transport trucks, so that these trucks, too, would be regarded as in "interstate commerce." If this "guess" be correct as to how the wage-hour officials will rule on terminals and bulk plants, then all employes at such terminals and bulk plants and truck drivers hauling out of such plants, would be regarded as subject to the law. Whether the courts would uphold this view, is another question.

Question: Does the law cover a man who unloads gasoline at a terminal, delivers to several stations by tank truck and also works occasionally in one of the company's service stations?

Answer: In the answer to the above question, we gave as our "best guess" that terminals would be held under the law—at least insofar as it applies to employes unloading the gasoline from the interstate carrier delivering to the terminal. The wage-hour division has given no indication of how it will rule on employes, part of whose duties (like selling in a service station) are apparently exempt under the law.

To Fix Standards For Oil Burners

N. P. N. News Bureau

NEW YORK, Oct. 15.—A committee composed of six burner manufacturers was selected at a meeting of the Oil Burner Institute at Philadelphia, Oct. 12 to establish its own standards for oil burner construction and to analyze standards already recommended by the Institute.

In September the Oil Burner Institute announced it had adopted "approval requirements" for mechanical draft oil burners and a "seal of approval" for such equipment. It was also announced that the Federal Housing Administration, which guarantees loans for home modernization, including installation of oil burners, would require the OBI seal of approval on all burners financed under the FHA after Oct. 1. This date was later extended by the housing administration to Oct. 31.

The Oil Burner Institute had made arrangements with the Lehigh University to certify equipment on which a manufacturer was seeking a seal of approval. The Institute now asks members not to send materials to the university, and to recall equipment already sent.

It was estimated that manufacturers producing about 85 per cent of the volume in the oil burner industry were represented at the Philadelphia meeting, where the problem of securing satisfactory oil heating systems in FHA financed homes was presented to the burner manufacturers by Robert K. Thulman, mechanical engineer for the housing administration.

Thulman stated that it was essential for the Federal Housing Administration to establish minimum standards covering materials and equipment. He said that, unless the industry established such standards, the FHA would feel compelled to do so.

The industry committee is composed of the Silent Glow Oil Burner Corp., Anchor Post Fence Co., Harvey-Whipple, Inc., Reif-Rexoil, Inc., General Electric Co., Air Conditioning Division, and Williams Oil-O-Matic Heating Corp. It will prepare its recommendations of minimum standards for a report to the burner manufacturing industry. The entire industry would then be polled for final action on the industry committee's recommendations.

Fair Trade Act Upheld In Court

N. P. N. News Bureau

NEW YORK, Oct. 17.—Supreme Court Justice Mitchell May of Brooklyn Oct. 14 granted a permanent injunction restraining the Essar Gas Stations, Inc., dealer of the Socony-Vacuum Oil Co., from selling branded gasoline at a price less than that stipulated by Socony under the state Feld-Crawford fair trade act.

The action was brought by another Socony dealer, Joseph Schumer, who operates a station 14 blocks from the defendant. It was sponsored by the Gasoline Merchants of Brooklyn and Queens, according to Louis Kimmel, business manager, who stated that "the association will continue to seek more injunctions against violators of the act."

Sol A. Herzog, general counsel for the Garage and Gasoline Station Operators Council of Greater New York with which the Gasoline Merchants association is connected, and Assemblyman Bernard Austin represented the plaintiff.

The Essar company admitted that it had sold gasoline at under the price stipulated in resale price contracts under the Feld-Crawford act. It contended, however, that the act was not applicable to gasoline sold in bulk, and applied only to packaged commodities.

The court, however, upheld the contention of the plaintiff that gasoline sold from a pump bearing the brand name of the product brought it within the purview of the fair trade act.

New Trial Date Set For Spring

N. P. N. News Bureau

CHICAGO, Oct. 17. — The new trial in the first Madison oil case for 18 defendants whose jury conviction was set aside will not begin until next spring, Federal District Judge Walter C. Lindley, new trial judge, ruled at a hearing here last week with defense and government counsel.

The tentative date of May 8 was set for start of the new trial in Madison. Last week's hearing, to set a trial date, was continued until April 17.

Possibility of arguments being heard in circuit court next February, on appeals of 17 defendants whose motions for a new trial were denied, caused the government to alter its desire to start the new trials this fall, Government Counsel John Henry Lewin announced.

The new trial was granted by Federal District Judge Patrick T. Stone in an order July 19 setting aside the jury's verdict for 15 individual and three corporate defendants. The order also set aside the verdict and dismissed the indictment for 10 individual and one corporate defendants, on which the government has started mandamus proceedings, and upheld the verdict for five individual and 12 corporate defendants who have appealed the sentence.

First Hearing on New Natural Gas Law

WASHINGTON, Oct. 17.—The Federal Power Commission, which was given authority to regulate natural gas transportation by the Lea Natural Gas Act passed by the last session of Congress, has taken its first action under provisions of the new law governing exportation of natural gas.

The law requires that the commission investigate and either grant or withhold authority for export of the gas from the country.

Four Texas natural gas companies have applied for this authority—all of them proposing to export gas to Mexico—and the commission has ordered hearings on the applications here Nov. 7 and 8.

Applicant companies are United Gas Pipe Line Co., Houston; United Gas Corp., Houston; El Paso Natural Gas Co., and Texas Cities Gas Co., Dallas.

Bring Small Marketing Units Into Program, Safety Men Told

CHICAGO, Oct. 17.—Accident fatalities in marketing are ten times those recorded by statistics gathered by the National Safety Council or the American Petroleum Institute, said F. R. McLean of Detroit, Socony-Vacuum Oil Co., before the petroleum section of the safety council, in its annual meeting here last week, in urging the expansion of the oil industry's safety program to include the smaller units in marketing. The same ratio probably holds for non-fatal injuries, he stated.

"The greatest need in accident prevention work in the petroleum industry at the present time is to bring small units effectively into the safety movement," McLean told the oil company safety executives.

As practical steps towards broadening the oil industry's safety program to bring in the small units in marketing he suggested:

That the state and local jobber organizations be urged and assisted in including a safety program among their activities.

That the major companies supply safety information to the marketers to whom they sell their products;

That every local and regional safety organization in the oil industry make provision to serve the small units as well as the large.

McLean, who also said that the accident fatalities among small producing concerns were three times those recorded by statistics, stated his estimates on fatalities and non-fatal accidents among the smaller units were based on the accident ratio in California and Ohio to production of crude and sales of gasoline there.

"This large number of accidents occurring outside the scope of our statistical gathering system, in spite of their remaining unenumerated, is still proportionately more important to us as an industry than the recorded accidents," stated McLean.

Small Units Flourish

"The prospecting, drilling and production of oil has been a work in which a host of individuals, firms and small companies have found a place," he told the oil company safety executives. "Again in the marketing field, the small, independently-owned type of operation seems particularly adapted and they have flourished and multiplied, so that a substantial percentage of the country's 27,000 bulk plants are operated by local jobbing companies and an even larger proportion of the 195,000 service stations are privately operated, not to mention all those gasoline sideline sellers identified by convenience with garages, hardware stores, general stores, etc."

That the accident rate is not still higher among the smaller units, is due to two factors, McLean brought out. The first, he said, was that the equipment available to these types of concerns usually has built into it the experience and knowledge of the industry and automatically puts a fundamentally safe plant into the hands of all operators except those "who do a little designing or converting of their own or who sacrifice safety in first costs."

The second factor in holding down the accident rate among the small companies, McLean said, was that such enterprises are usually under the personal supervision of the owner, partners or major stockholders who have not only their invested money but also their means of daily livelihood both at stake in the safe operation of their businesses.

"It cannot be questioned," he stated, "but that the personal and direct interest and leadership of these men goes a long way to compensate for any disadvantages from the safety standpoint under which they operate."

McLean told the safety executives that the larger interests in the oil industry have a mutual stake with the independent jobber and retailer in the improvement of his accident record.

Have Double Interest

Insurance rate-making methods average losses among similar operations or risks and, to a greater or less degree, depending on the extent of individual merit rating, those with low accident costs are helping to carry the load for those with high accident costs, he said.

"Again, a serious fire or accident in any plant in a community in which you operate may result in regulatory penalties being placed on the entire industry located in that town or city or even state. In such cases, the authorities tend to consider all oil companies alike and it is sometimes very hard to explain that a similar disaster cannot occur in your plant or others which are properly constructed, safeguarded and operated," he told the oil company safety executives.

The oil company safety engineers and executives gathered here for the Silver Jubilee Congress of the National Safety Council heard formal papers, authorized a new committee on publications, and elected J. H. Brown of New York, Tide Water Associated Oil Co., sectional chairman for the coming year.

The new publications committee will have as its task the establishment of libraries and bibliographies on petroleum safety work. The University of Oklahoma extension department is preparing a bibliography and an unabridged library on all phases of safety work, including that in the oil industry. J. C. Young of Tulsa, Tide Water Associated Oil Co., is chairman of the new publications committee.

A common cause exists between the safety engineer and the fire department said C. J. Nobmann of San Francisco, Shell Oil Co., in an address before the petroleum section and co-operation is of mutual benefit.

"Our specialized knowledge and experience, particularly of a technical nature should be placed at the disposal of the fire authorities to assist them in both fire prevention and control," he said.

Co-operation with fire chiefs, marshals and other authorities was urged in assisting "in the drafting of reasonable and practical legislation designed to improve or maintain a good record."

The "almost impossible task" of reaching independent operators in the producing fields not large enough to maintain a safety organization, was noted in an address by John E. Mitchell of Dallas, Hartford Accident & Indemnity Co.

"The one thing necessary to our getting started on this preliminary work is to find someone in position to underwrite the expense," he said. "I have mentioned that it seemed logical for the major companies to give certain types of work to service contractors and in some instances to use contract drillers. Bad accident experiences are reflected by high insurance rates. The cost of insurance is an item which is included in the contract price.

"It would be an interesting question to determine from an insurance standpoint just how much these independent producers and contractors have cost the major companies through their unfavorable accident experience. It is my belief that the basic rates charged for insurance are influenced to a large extent by the experience of the independent operators."

Mitchell suggested that the major oil companies and the National Safety Council join in developing a safety program on behalf of the independent operators.

New Officers, Oil's Safety Section

CHICAGO, Oct. 17.—New officers of the petroleum section of the National Safety Council, elected at the section's meeting here Oct. 10-14, in connection with the Silver Jubilee Congress of the safety council, are as follows:

Petroleum section chairman, J. H. Brown of New York, Tide Water Associated Oil Co.

Atlantic Division chairman, A. M. of McKean of New York, Pan American Petroleum & Transport Co.

Great Lakes division chairman, Joseph Bernd of East Chicago, Sinclair Refining Co.

Gulf division chairman, T. S. Maffitt, Jr., of Houston, Houston Oil Co.

Mid-Continent division chairman, Harry T. Markee of Bartlesville, Okla., Phillips Petroleum Co.

Rocky Mountain division chairman, Boyd V. Osborne of Casper, Wyo., Standard Oil Co. of Indiana.

Pacific Coast division chairman, A. L. Anderson of San Francisco, Standard Oil Co. of California.

H. N. Blakeslee of New York, head of the department of accident prevention, American Petroleum Institute, was re-elected secretary of the petroleum section.

Committee Chairmen Listed

Following are the committee chairmen for the petroleum section for the coming year aside from Chairman Young of the new publications committee previously named:

News letter, R. S. Hoffman of Tulsa, Oklahoma Natural Gas Co.

Engineering, G. E. Carpenter of Houston, Humble Oil and Refining Co.

Health, Dr. James W. Long of Port Arthur, Gulf Oil Corp.

Visual education, E. D. Murphy of Tulsa, Mid-Continent Petroleum Corp.

Statistical, Hadley Myers of Tulsa, Sinclair Prairie Oil Co.

Industrial data sheet, H. E. Dischinger of St. Louis, Shell Petroleum Corp.

Program, H. W. Boggess of Tulsa, Sinclair Prairie Oil Co., the retiring general chairman of the section.

U. S., Louisiana Debating Title To Gulf Islands

By Teletype
N. P. N. News Bureau

TULSA, Oct. 18. — The opening gun in what may become a legal battle between the State of Louisiana and the federal government was fired this week in the form of advertisements in a trade journal.

The Department of the Interior advertised for sale, for oil and gas development purposes two units in La Fourche Parish, La., along the Gulf Coast. The larger unit is 295.77 acres comprising East Timbalier Island, also known as Bird Island. Unit No. 2 consists of two smaller islands of 11.69 and 69.29 acres.

Bids will be received at the office of the Secretary of the Interior up to 12 noon, Oct. 31. This advertisement asserts that protests by the states as to ownership were overruled by the secretary after hearing on July 29, 1938. The ruling was that the U. S. has asserted ownership and jurisdiction over East Timbalier for more than 100 years and that the group of islands is public land of the U. S.

In its advertisement, the state gave notice that it will "enforce and protect its rights as owner of said lands and every part thereof and its rights as such owner to oil, gas and other minerals therein or thereunder."

Gulf Oil Corp., which holds a marine lease from the state on Timbalier Bay, in which the islands are situated, was denied permission by the war department to drill two wells. The wells were to have been drilled in the water, not on the islands, indicating possibility that the federal government may also claim the surrounding waters.

Not bearing upon the immediate controversy but indicative of the state's broad contention of ownership was the act of legislature in Louisiana recently declaring that the state has title to waters and islands to the 20-mile limit. It asserted that the three-mile limit was originally established because that was as far as a cannon would shoot but that with modern armament the state can enforce its jurisdiction for 20 miles.

Ickes ruling as to ownership of the islands in Timbalier Bay asserted that President Tyler included East Timbalier Island in a military reservation in 1844, President Cleveland placed it under jurisdiction of the Interior Department in 1886 and President Roosevelt declared it to be a bird refuge in 1907.

Oilgram Checks into Low-Priced Sale Of Gasoline Reported By Oil Jobber

N. P. N. News Bureau

CLEVELAND, Oct. 18.—Following the crude price cuts of last week, *Platt's Oilgram* received a complaint from a jobber stating that he had purchased 70-72 octane gasoline for shipment from an Oklahoma refinery at 4.375 cents, whereas *Oilgram* was showing a price of 4.625 to 5.5 cents in its Oklahoma Refinery Market.

Without divulging the jobber's identity, *Oilgram* telephoned the refiner asking whether or not he had quoted or sold in the open spot market at the price the jobber reported.

The refiner said he had not made any open spot market quotations or sales to jobbers for many weeks, that the only sales he had made were on contract, or on the basis of 0.375 cent under a published price (not *Oilgram's*), date of shipment. This was the reason, the refiner pointed out, that he had not reported any prices to *Oilgram* for many weeks.

Oilgram then wired the jobber asking if he could send any papers which would throw light on the subject, and today *Oilgram* received a copy of the refiner's confirmation of the order which he had sent to the jobber. This confirmation showed that the order called for "regular gasoline" with the price to be "¾ under CJC" (apparently referring to the Chicago Journal of Commerce).

This confirmation of the order indicated that the purchase was of a type which *Oilgram* has never recognized as an open spot market transaction, namely, a sale at a discount off a published price. The price is usually undetermined in such transactions because it is dependent upon a publication's price on date of shipment.

"All I have to say is their salesman, Mr. ....., called on me about 11:30 in the forenoon of October .," the jobber explained in a letter accompanying his confirmation of the purchase, "and I asked him his price on a carload of 70-72 leaded gas and he quoted me .04-⅜, which, he said, was ⅜ under the Chicago low." (Apparently this is a reference to the low of the price range as published by the Chicago Journal of Commerce; it could not refer to *Oilgram's* Chicago low —Mid-Western Tank Car Market—because that price was 4.25 cents and ⅜c off that would be 3.875c, instead of 4.375c mentioned in the letter.)

"This morning," the jobber went on to explain, "I have an acknowledgment of the order which I am sending you and in this acknowledgment they have made the price quoted ⅜ under Chicago Journal of Commerce and I suppose they interpret this to mean a contract sale, but in my opinion it was a spot sale, as I asked the salesman his price on a carload of gas and he quoted me 4⅜. Under such circumstances as above outlined it is no wonder that you do not have any spot sales in the market you quote."

Most sales of unbranded gasoline today that the trade may think of as "open market" sales are not such because they are based on a published price, date of shipment, and at a discount off the daily published price, (as pointed out by Editor Platt in N.P.N. Oct. 12.) If *Oilgram* were to recognize sales made at a discount off its own published prices, then it would be only a short time before *Oilgram's* price would be down to zero, because each day's price would automatically be below the previous day's price.

Pennzoil Builds Plant Additions

OIL CITY, Oct. 18. — Addition of a heavy oil furnace to the community cracking unit at Pennzoil Co.'s No. 2 plant near here will increase the cracking capacity of that plant from 2500 barrels to 4500 barrels daily of Pennsylvania fuel oil, information received here indicates. This revamping work is approaching completion and the unit should be on stream within a few weeks, it is understood.

On the completion of the new coil, the charge stock from the crude still will be divided into a light and a heavy fraction, the light oil coming from the side of the tower, the heavy oil from the fractionator bottom. A new and larger flash chamber is being added also, to handle the greater throughput of the expanded unit. Both streams will use the same chamber, fractionating and condensing equipment.

A Worthington 12,000-barrel-per-day centrifugal hot oil pump is also being installed, driven at 3000 r.p.m. by a gas engine of the same make at 400 r.p.m., through a speed increaser gear system.

Foundations are also being sunk for a Universal Oil Products catalytic gas polymerization unit, which will produce 300 barrels per day of polymer gasoline, utilizing the gases from all three cracking units at this plant. This unit will operate at pressures up to 1200 pounds, it is reported, the charge being continually in the liquid phase throughout the process.

More recent experiences in polymerization show distinctly superior advantages from this type of operation as compared to earlier operations. The unit will be non-regenerative, discarding the catalyst after its efficiency is exhausted. The efficiency life of the catalyst has been increased remarkably in the last two years or so, according to informed technologists.

Price Restored If Production Can Be Reduced

N. P. N. News Bureau

LOS ANGELES, Oct. 15.—In an effort to straighten out a highly demoralized situation in the Santa Maria Valley field where, because of lack of posted prices, the heavy, high asphalt crude has been selling for almost any offered price—30 cents a barrel and up—Union Oil Co. has announced restoration of price postings in effect before a drastic cut last May.

Effective at 7 a.m. today, Union, with the only pipeline connection out of the field, stated it would pay 63 cents for 13 to 13.9 gravity oil; 65 cents for 14 to 14.9 gravity; 68 cents for 15 to 15.9; and 70 cents for 16 gravity and above.

However, re-establishment of this price schedule was understood to be predicated upon the success of a plan to curtail production in the field to a maximum of 10,000 barrels a day. Current production is in the neighborhood of 22,000 barrels and the potential is placed at approximately 109,000 barrels.

Under the plan, discussed by Santa Maria Valley producers last week, there will be a trial period of 30 days in which to make curtailment efforts 100 per cent effective. It is also proposed that no unnecessary wells shall be drilled.

Soon after the drastic cut of from 23 to 26 cents a barrel in posted prices by Union last May, the company announced discontinuance of any purrefineries have been built in the area and truck loads of the crude have found an outlet at seaboard for shipment east, and in the Los Angeles Basin or points nearer to Santa Maria, for making asphalt and road oils.

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Crude Price Changes

Below is given the new price postings of individual purchasing companies, the amounts of the change and the effective date, for companies whose changes were not reported in last week's NPN. The detailed postings under their new schedules for principal purchasers is given in the Crude Price tables, in the market section of this issue.

PITTSBURGH—Effective Oct. 18, Joseph Seep Purchasing Agency reduced Corning, O. crude 10 cents, to new price of $0.97 per barrel. Last previous change was a 10 cent cut, Sept. 3.

CLEVELAND—Effective Oct. 13, Owensboro Corp. S. O. Ohio subsidiary, reduced new southern Illinois crude 10 cents, to new price of $1.15, except in the congested area of the Centralia field, which remains $1.15.

Effective Oct. 13, Fordsville Gathering Lines, Inc., also S. O. Ohio subsidiary, reduced Birk City and Owensboro district, western Kentucky crude, 10 cents, to new price of $1.10 for both.

ASHLAND, KY.—Effective Oct. 14, Ashland Oil & Transportation Co. cut Somerset, Ky., crude 10 cents to new prices of $1.20 for Kentucky River production, and $1.12 for Big Sandy River production.

LOUISVILLE—Effective Oct. 12 Stoll Oil Refining Co. cut Stoll Pipe Line Oil in its Kentucky lines, 10 cents, to new price of $1.10 per barrel.

FINDLAY, O.—Effective Oct. 13 The Ohio Oil Co., reduced Central States crudes 10 to 20 cents. Its reduction in Lima, O., the new Illinois Basin, and Western Kentucky (Owensboro), was 10 cents; in the old Illinois field, and in Princeton, Ind., 20 cents.

TULSA—Effective Oct. 14, Carter Oil Co. reduced Loudon area, Fayette county, Ill. crude 10 cents, to new price of $1.15 per barrel.

MT. PLEASANT, MICH.—Effective Oct. 13, Simrall Corp. reduced Michigan crude 10 to 13 cents. Freeman was cut 13 cents, other crudes 10 cents. New prices are: Crystal, Greendale and Porter, $0.925; Beaverton, Bentley, Buckeye, Edenville, $0.90; Freeman, $0.87; and Arenac, and West Branch, $0.74.

TULSA—All major purchasers of Mid-Continent crude have met the reductions posted, beginning Oct. 11, by the Standard of Indiana interests in Oklahoma, Kansas and North Texas, and by Humble Oil & Refining Co. in Texas and New Mexico. These cuts amounted to 20 cents in Oklahoma and Kansas, and from 1 to 36 cents over Texas.

Companies not previously reported as having met these cuts in the Oct. 12 issue of N. P. N., pages 5 and 19, are:

The Carter Oil Co.: Effective Oct. 13, in Oklahoma only, posted a schedule beginning with below 21 gravity at $0.60; with 3 cent differential up to and including 30-30.9, at $0.90; from there on, 2 cent differential, to top grade of 40 and above, at $1.10.

Continental Oil Co.: Effective Oct. 11, in Oklahoma, Kansas and North Texas, met S. O. Indiana gravity and price schedule in full. In Carson and Hutchinson counties, Panhandle, Tex., met Humble's prices in that field in full. In Colorado, Continental reduced Fort Collins and Wellington crudes 20 cents, posting $0.81 for below 29, with 2 cent differential, to top grade of 40 and above, at $1.05; and also reduced Canon City and Florence, 20 cents, to new price of $0.90. In New Mexico, it placed Artesia, Jackson and Maljamar crudes on a gravity basis, ranging from $0.61 for below 29, to $0.85 for 40 and above with 2-cent differential; these three crudes being formerly posted at flat price of $0.90. In Montana, Cat Creek was cut 20 cents, to new price of $1.10. In Wyoming, Big Muddy and Lance Creek cut 20 cents, to new prices of $0.98 and $0.77 respectively. In Louisiana, Tepetate and Ville Platte both cut 21 cents, to new price of $1.03 for both.

Magnolia Petroleum Co.: Effective Oct. 12, in Oklahoma, posted below 21 gravity, at $0.60, to top grade of 40 and above, at $1.10, with same price differentials as Carter Oil. In North and North Central Texas, including Archer, Burkburnett, Comanche, Electra, Henrietta, and Olden, below 29 at $0.79, with 2 cent differential, to top grade of 45 and above, at $1.13.

In the Panhandle, Texas, district, in Gray, Carson and Hutchinson counties, met Humble gravity and price schedule, except that Magnolia's lowest grade is below 29 gravity. In West Texas, in counties of Crane, Glasscock, Howard, Mitchell, Upton and Winkler, met Humble, except that Magnolia's lowest grade is below 25 gravity, at $0.63. In East Texas, met Humble.

South and Southwest Texas crudes, cut 13 cents, to new prices to $0.87 for Luling; $0.99 for Lytton Springs; $1.14 for Cleveland, and $1.02 for Hardin, Liberty county. In Tomball, met Humble. In Mirando, Texas posted below 20 gravity at $0.81, plus 2 cent differential, to top grade of 40 and above, at $1.23. In Cass and Panola counties, Texas, cut 17 cents, posting below 25 gravity at $0.73, with 2 cent differential, to top grade of 40 and above, at $1.05. Beaumont, Texas, cut 1 to 14 cents, with below 20 gravity at $0.79, plus 3 cent differential to 26-26.9, which is $1 from there on, 2 cent differential, to top of 40 and above, at $1.28.

In Louisiana and Arkansas, met Humble's gravity and price schedule in districts of Pine Island, Haynesville, Bull Bayou, Cotton Valley, Rodessa, La., and in Eldorado and Rainbow, Ark.; also met Humble in Smackover. In Lockport, Iowa and Cameron Meadow field, La., Magnolia posted below 18 gravity at $0.74, plus 2 cent differential, to 21-21.9, which is $0.82; 3 cent differential from there to 26-26.9, which is $0.97; and again 2 cent differential from there to 34 and above, which is $1.13.

Inventories of Penn. Grade Bright Stock and Steam Refined Show Gain

N. P. N. News Bureau

WASHINGTON, Oct. 18.—The stocks trend of Pennsylvania lubricating oils was reversed when inventories of three of the four major items increased in the seven-day period ended Oct. 13, according to the report of the National Petroleum Assn. today.

Inventories of bright stock increased 417,677 gallons to 14,293,991 gallons, the N.P.A.'s report showed, and stocks of 600 steam refined and the higher viscosity neutrals were up 343,514 gallons and 341 gallons, respectively. Stocks of 142-180 vis. neutrals declined 207,298 gallons.

Inventories of all of the major lube items on Oct. 13, however, were substantially under inventories reported by the association as of Oct. 14, 1937. In the 142-180 vis. neutrals, inventories last year were almost double the Oct. 13, 1938 level.

Comparison of inventories as compiled by the N.P.A. from reports of all companies which refined Pennsylvania crude oil, follows, in accompanying box.

Sohio's Illinois Crude Takings

CLEVELAND, Oct. 17.—Crude oil takings in Illinois of the Owensboro Corp., purchasing subsidiary of the Standard oil Co. of Ohio, are running about 25,000 barrels daily.

The per-well takings are larger in the areas where there are fewer wells, it is understood; with purchases running from 40 to 75 barrels in the shallow sand production on the western side of the state. Full production is being taken in the Centralia field and averages about 35 to 40 barrels per well. Owensboro is taking, in most fields on the eastern side of the state, full production or 100 barrels, whichever is the larger.

	Oct. 6, 1938 Gallons	Oct. 13, 1938 Gallons	Oct. 14, 1937 Gallons
1. **Raw Long Residuum** (Including all raw long residuum below, and not salable, as 600 fire)	2,898,203	2,877,421	1,197,736
2. **Steam Refined** (Includes all steam refined stock commonly sold or used as 600 and as raw material for bright stocks)	9,413,513	9,757,027	10,975,571
3. **Other Steam Refined** (Not included in 1 and 2 above)	6,218,860	6,265,333	4,198,645
4. **Finished Dewaxed Long Res.** ...	2,037,291	2,080,910	2,877,584
5. **Bright Stock** (Does not include any material reported in 4, above)	13,876,314	14,293,991	15,113,170
6. **Viscous Neutral**, below 180 vis. but not below 142 vis. @ 100	4,654,852	4,447,554	7,639,921
7. **Viscous Neutral**, 180 vis. @ 100 and above	7,749,971	7,750,312	8,575,898

'Gas' Stocks Cut, In Spite Of Higher Runs

N. P. N. News Bureau

NEW YORK, Oct. 18. — Although daily average refinery crude runs were 105,000 barrels higher, increasing the operating rate of reporting refineries from 80.3 per cent to 83.3 per cent of capacity, production of gasoline was lower and U. S. gasoline stocks declined 280,000 barrels in the week ended Oct. 15, report of the American Petroleum Institute today showed.

The institute's report indicated increased crude runs for seven of the 10 refinery districts covered by its report.

Gasoline production at plants reporting to the Institute was 67,000 barrels lower than in the week ended Oct. 8.

Estimated U. S. gasoline stocks Oct. 15 totaled 68,426,000 barrels, 1,760,000 barrels above stocks on the same date last year. In the October 8-15, 1937 period, stocks increased 600,000 barrels as compared with last week's drop of 280,000 barrels.

Stocks of gas oils and distillates increased 432,000 barrels last week, while inventories of residual fuels declined 59,000 barrels for a net increase of 373,000 barrels in stocks of all gas and fuel oils. Total inventories Oct. 15 were 152,648,000 barrels, with the light fuels 5,235,000 barrels higher and the heavy fuels 29,327,000 barrels higher than on the same 1937 date.

API Will Elect Nine Officers

N. P. N. News Bureau

NEW YORK, Oct. 17. — Highlight of the American Petroleum Institute's 19th annual convention Nov. 14 to 18 at Chicago will be two speeches by two former administrations of the NRA—General Hugh S. Johnson and Donald R. Richberg.

Richberg will speak at the first general session, scheduled for the afternoon of Wednesday, Nov. 16th, sharing the program with Axtell J. Byles, A. P. I. president. General Johnson will speak at the second general session on the afternoon of Nov. 17. Another speaker for that same afternoon will be J. Howard Pew, Philadelphia, of Sun Oil Co.

Elections will be for the posts of nine officers, 54 directors, and 60 divisional committee men whose terms expire this year.

Latest Oil Industry Statistics

Trends of Basic Figures

	Oct. 15	Oct. 8	Oct. 15 '37
Crude Production (bbls. daily)	3,271,600	3,249,350	3,602,150
Crude Imports (bbls. daily)	88,000	118,285	100,570
Crude Runs to Stills (bbls. daily)	3,310,000	3,205,000	3,388,000
Gasoline Stocks (bbls. total)	68,426,000	68,706,000	66,666,000
Gas & Fuel Oil Stocks (bbls. total)	152,648,000	152,275,000	118,086,000

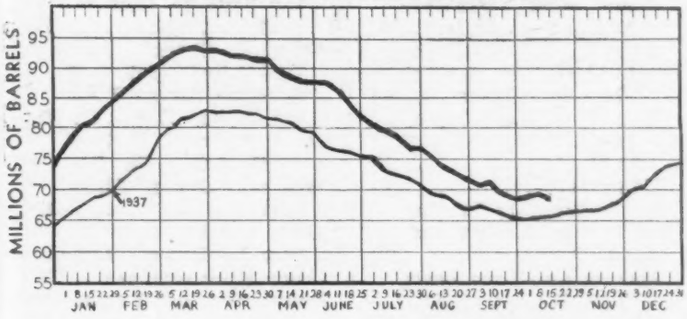
Crude Oil Production for the U. S.

(Reported by American Petroleum Institute)

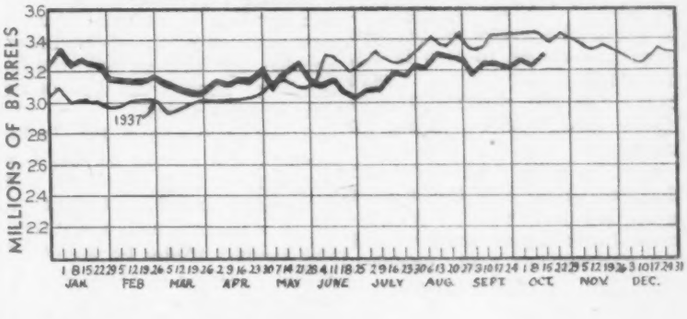
	Week Ended Oct. 15 Barrels Per Day	Oct. 8 Barrels Per Day	Oct. 1 Barrels Per Day
Oklahoma City	108,900	99,300	95,200
Total Oklahoma	457,050	450,400	454,050
Kansas	155,300	154,700	159,400
East Texas	369,750	369,300	369,000
Total Texas	1,248,700	1,242,150	1,236,300
Total Louisiana	268,350	270,650	260,600
Illinois (New pools)	77,800	80,000	77,700
California	677,800	661,400	655,400
East of Rockies	2,593,800	2,587,950	2,576,400
Total U. S.	3,271,600	3,249,350	3,231,800
Crude Imports	88,000	18,280	57,000
Total New Supply	3,359,600	3,267,630	3,288,000

Current Refinery Operations

TOTAL U. S. MOTOR FUEL STOCKS



DAILY AVERAGE CRUDE RUN TO STILLS



A. P. I. Weekly Refinery Report

(Figures in Thousands of Barrels of 42 Gallons Each)

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills Week Ended		Per Cent of Reporting Capacity Operated Week Ended		(a) Gasoline Production Week Ended		Stocks Total Finished and Unfinished Motor Fuel(b) Week Ended		Stocks of Gas and Fuel Oil Gas Oil and Distillates Week Ended		Residual Fuel Oil Week Ended		Total Week Ended	
		Oct. 15	Oct. 8	Oct. 15	Oct. 8	Oct. 15	Oct. 8	Oct. 15	Oct. 8	Oct. 15	Oct. 8	Oct. 15	Oct. 8	Oct. 15	Oct. 8
East Coast	100.0	560	530	91.1	86.2	1,435	1,415	18,427	18,631	7,729	7,646	8,593	8,652	16,322	16,298
Appalachian	85.9	99	103	77.3	80.5	333	355	2,847	2,895	253	271	617	642	870	913
Ind., Ill., Ky.	89.0	436	448	89.7	92.2	1,824	1,843	10,268	10,502	3,778	3,765	5,574	5,667	9,352	9,432
Okla., Kans., Mo.	81.6	263	255	76.9	74.6	1,039	968	6,006	6,054	1,338	1,310	3,332	3,335	4,670	4,645
Inland Texas	50.3	105	110	66.0	69.2	459	445	1,603	1,612	378	378	1,621	1,621	1,999	1,999
Texas Gulf	88.9	773	761	92.2	90.8	2,484	2,615	9,562	9,539	6,226	6,053	8,288	8,121	14,514	14,174
La. Gulf	97.3	121	114	83.4	78.6	291	288	2,203	2,144	1,135	1,169	2,187	2,148	3,322	3,317
No. La., Ark.	55.0	51	35	92.7	63.6	108	83	471	465	247	243	567	553	814	796
Rocky Mt.	54.2	52	49	81.3	76.6	220	206	1,102	1,107	128	121	633	693	761	814
California	90.0	519	467	69.7	62.7	1,575	1,617	12,397	12,217	10,776	10,610	85,898	85,937	96,674	96,547
Total Reporting	85.5	2,979	2,872	83.3	80.3	9,768	9,835	64,886	65,106	31,988	31,566	117,310	117,369	149,298	148,935
Estimated U. S. Total (Bur. of Mines)		3,310	3,205					68,426	68,706	32,778	32,346	119,870	119,929	152,648	152,275

(a) Includes straight-run, cracked, and natural blended.
(b) Includes stocks at refineries, in bulk terminals, pipe lines and in transit.
(c) 12% of reporting capacity in this district did not report gasoline production.

Gain of 574,000 Bbls. In Crude Oil Stocks

N. P. N. News Bureau

WASHINGTON, Oct. 17.—Crude stocks gained 574,000 barrels during the week ended Oct. 1, and reached a total of 280,852,000 barrels on that date, the U. S. Bureau of Mines reports. It added that the 684,000-barrel increase in domestic stocks (which was offset by a 110,000-barrel decrease in foreign crude) was "believed to reflect exports delayed by unsettled conditions in Europe, as well as a general end-of-month emptying of lease storage, which was accentuated by anticipated price declines."

Stocks were 309,036,000 barrels on Oct. 2, nearest comparable date last year.

Stocks by grade or origin, showing changes, appear in adjoining column. (Figures in thousands of barrels.)

BIG SPRING, Texas, Oct. 17.—Plans are being made to build a gasoline absorption plant on Cosden Petroleum Corp.'s Sewell leases in Young county in the near future, says an announcement by the company to its stockholders.

Grade or origin	Sept. 17	Sept. 24	Oct. 1	Change from Sept.24
Pennsylvania Grade	6,243	6,266	6,214	— 52
Other Appalachian	1,352	1,321	1,332	+ 11
Lima-Michigan	1,187	1,221	1,163	— 58
Illinois-S. W. Indiana	11,023	11,033	11,058	+ 25
Arkansas	2,990	3,066	3,070	+ 4
Kansas	6,252	6,206	6,160	— 46
Louisiana:	13,885	14,012	14,460	+448
Northern	6,078	6,123	6,196	+ 73
Gulf Coast	7,807	7,889	8,264	+375
New Mexico	7,409	7,458	7,633	+175
Oklahoma	77,760	77,151	77,056	— 95
Texas:	95,576	94,647	95,009	+362
East Texas	22,629	22,438	22,543	+105
West Texas	17,928	18,048	18,313	+265
Gulf Coast	20,183	19,677	20,025	+348
Other Texas	34,836	34,484	34,128	—356
Rocky Mountain	21,730	21,609	21,518	— 91
California	32,853	33,745	33,746	+ 1
Foreign	2,685	2,543	2,433	—110
Total U. S. refinable	280,945	280,278	280,852	+574
Heavy in Calif.	17,313	17,280	17,433	+153

Show ICC Truck Regulations In Conflict with State Laws

(*Continued from page* 13)
was believed to offer temperature changes as severe as can be found anywhere in the U. S. and results of the study were felt to prove that the outage chart included in the proposed regulations is unreasonable in its requirements.

Test Data Shown

The test data covered transport truck runs up to nearly 500 miles from the southern California point of origin and was for periods as high as 40 hours. During this time, temperature of the transported liquid—56.4 API gravity—was recorded as high as 110 degrees F., compared to a loading temperature of about 74 degrees. At periodic intervals of one to two hours, temperature readings were taken "in the shade," "top of cargo tank," and "liquid in tank."

Results of these tests were declared to indicate the lack of need for any outage requirement in excess of one per cent for distribution tank vehicles, although it was thought a maximum figure of two per cent would not be unreasonable in this operation.

It was pointed out that conditions peculiar to distribution tank vehicles must be given consideration with respect to outage requirements: namely, (1) the definitely restricted territorial scope of operation; (2) the very limited time period in which a distribution tank vehicle carries a full load; (3) the even more nominal time period which elapses from the time of loading to the time of the first delivery, after which excessive outage is automatically established.

The report, which was prepared by J. W. Sinclair, supervisor of automotive equipment for the Union Oil Co., with the co-operation of the Lang Transportation Co., stated that results showed a minimum outage requirement of two per cent would be adequate for transport trucks. Representatives of contract tank lines said an outage of three per cent, minimum, would not be excessive.

Truckers Testify

Representatives of motor truck associations and of motor truck and tank line carriers testified as to the effect of the proposed regulations on their operations and in many cases reiterated comments made by the oil company witnesses.

In each case witnesses were questioned by the examining board as to whether they would be satisfied with the regulations if their recommendations were incorporated. This question was asked as to the factual nature of the provision and in the case of the private carriers did not carry any recognition of ICC jurisdiction over these carriers, it was pointed out.

In general, it was believed that modification in line with the suggestions would make the regulations more applicable to operations in this area and would make them in keeping with existing state regulations under which the carriers have been operating.

Late in the hearing, the commission's representatives raised the question of need for special rules on duration of hours of service by drivers on trucks hauling explosives or other dangerous articles.

Searls questioned the inclusion of this matter at the Los Angeles hearing; said he had received no notice, had prepared no answer, and had understood this subject would be discussed at the sectional meeting in Chicago Nov. 4.

However, he said that there was no special stress or strain on drivers of equipment handling these commodities which would make it necessary for more stringent regulations in this regard than for drivers of trucks handling general merchandise. Roy B. Thompson, representing the Truck Owners Assn., concurred in this opinion.

ICC representatives conducting the Los Angeles hearing included: W. T. Croft, examiner; H. H. Allen, associate engineer, section of safety, Bureau of Motor Carriers; and L. I. Doyle, explosives agent, Bureau's Service.

Former Oil Publisher Dies in Florida

CHICAGO, Oct. 17.—Harry Shaw, 52, publisher of an oil marketing journal several years ago, and secretary of the former Western Oil Jobbers Assn., died Oct. 16, at Sarasota, Fla., after two years of ill health.

He had been out of the oil publishing business for the past 15 years and more recently acquired a half interest in a radio station at Waterloo, Ia., and was at one time president of the Radio Broadcasters Assn.

Harry Shaw was a brother of Ray Shaw, founder and head of the Chek-Chart Co., Chicago.

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Dates For Bids Set

WASHINGTON, Oct. 17. — Treasury Procurement Division announces opening dates for bids to supply government gasoline requirements during the Jan.-March quarter of 1939 as follows: Region 1—Oct. 26; Region 2—Oct. 24; Region 3—Oct. 28; Region 4—Oct. 24; Region 5—Oct. 26; Region 6—Oct. 28.

Hearings Ordered on Rail Rate Slash

WASHINGTON, Oct. 14. — Interstate Commerce Commission has ordered hearings Dec. 1 at Memphis, Tenn., on application of railroads to slash rail rates on gasoline and kerosine from New Orleans-Baton Rouge group points to Florence, Sheffield, Decatur and Guntersville, Ala., to meet barge competition on the Tennessee river.

Standard Consistency Grades Coming for All Greases

By M. G. Van Voorhis

Present serious efforts on the part of the National Lubricating Grease Institute to classify greases by accurately defined ranges of consistencies in terms of penetration, is an outstanding forward step in the ultimate straightening out of the confusing array of greases and grease properties which have faced machine designers of all industries. That the effort is being appreciated by grease users could almost be felt in the apparent closer mutual appreciation of problems of grease makers and users as shown at the recent annual meeting of the institute.

Discussed often and over a long period of time, the classification of greases by consistencies is like the weather which Mark Twain spoke of, according to M. B. Chittick, chairman of the technical committee of the grease institute which has the project in charge; everybody has talked about it, but nobody has done anything about it.

But the committee has now done something about classification in a manner which promises to be and is designed to be of greatest benefit to all consumers, regardless of where they obtain their lubricants. It is safe to say that the worthiness of the project will have its own reward.

The significance of closer definition of consistency in terms of penetration measurements is that the human element will finally be pushed out as a method of estimating grades of consistency. No longer will a finger poked into a batch of grease be allowed to determine whether the grease is a No. 1 or a No. 2 grade. Instead, actual penetration tests by a standard test method will determine within what standard range of consistencies (given elsewhere in this issue) the grease lies.

On the surface a very obvious and simple step to take, this proposal has met some reasonable opposition as well as some of the other kind. No doubt the confusion of change has been feared as much as anything else in spite of the past chaotic conditions. This is the kind of opposition that has balked proposals to standardize weights and measures to the decimal system. Again many experienced users are getting satisfactory results with the present grease tests, in the less severe applications particularly.

Standardization has been delayed by disagreement in deciding upon just what ranges of penetration shall constitute a given classification and, no doubt, also by the fact that the penetration test itself is only tentative and possibly subject to changes which would alter the meaning of the depths of penetration. Present formulation of a tentative classification will not be completed until agreement has been reached as to the ranges of penetration in each class. When this is complete, other technical groups will be given opportunity for study and adoption.

The grade numbers correspond closely to numbers which have been in general use with cup greases but are now designed to cover all greases whether a lime base grease or aluminum base, whether a cup grease or an extreme pressure grease, and whether used in babbitt bearings, roller bearings or on hypoid gears. Since it is now possible to measure penetrations of the heaviest greases, the number of classifications is beyond that used for cup greases.

Penetration and consistency, of course, no more exactly define a grease than S.A.E. numbers do lubricating oils but, like these numbers which give ranges of viscosity, the penetrations do define one of the most used properties of greases and thus give the user a greater confidence that a given grade of grease will always fall within defined limits which are as sharply fixed as the classification of the various metal bases.

Contents

Rapid Methods for Determining Oil in Lubricating Grease—By C. J. Boner, L. W. Yagle and G. A. Williams **R-498**

Where five to six hours is too long to determine oil content of lubricating grease a quick method or excellent accuracy will reduce the time to one-fourth.

Grease Test Machine Yields Essential Service Data **R-502**

Application of Propane to Manufacture of Pennsylvania Lubricating Oils—by W. B. McCluer, J. T. Dickinson and H. O. Forrest **R-504**

Commercial operating results are presented in the application of propane dewaxing and deresining to reduce costs of manufacturing Pennsylanvia lubricating oils, to increase the amount of effective neutral and to prepare stocks for efficient single solvent treatment.

Rapid Methods for Determining Oil in Lubricating Grease

By C. J. Boner, L. W. Yagle and G. A. Williams*

Presented as a paper at the Sixth Annual Convention of the National Lubricating Grease Institute in Chicago, Oct. 3-4, and read by J. R. Battenfeld.

The demand for quick results in the modern laboratory is responsible for the devising of methods for the separation of oils from lubricating greases which take less time and are more simple than the American Society for Testing Materials method (Sections 15-20 Method D 128-37, ASTM Standards on Petroleum Products). If care is used in separating oils by these rapid methods, an oil of the same purity and characteristics can be obtained as by use of the standard method.

Rapid separation methods for three types of greases are described in the accompanying article; namely, calcium greases, soda base greases, and aluminum base greases. Determination for calcium greases depends upon syneresis of completely dehydrated grease and for soda base greases upon the solubility of the soap in water. Aluminum base greases are converted to soda soap and then dissolved, as is done with regular soda greases. The method is not quantitative nor is it adapted to rosin greases. No work has been done with greases containing additives.

THE general plan used for the quick separation of oil from calcium greases depends on the fact that most calcium base greases, if completely dehydrated, will exhibit syneresis. In order to have an abundance of oil separate, it is best to use about 750 grams of greases below 250 penetration and 500 to 600 grams of greases above 250 penetration. The grease is weighed into a three-quart kitchen pan, either black iron or granite-ware and about 1% of hydrated lime added. It is then heated to 300° F. and held there with stirring until thinning is noted, which is usually about one minute. The sample is then set off the fire to cool. It is then found that at 300° F. the water has left the grease and foaming has ceased. Oils will seldom be encountered in lubricating greases with flash points below 325° F. Hence the oil should not be changed by this treatment.

If a real speedy determination is desired on the oil characteristics of the grease, it is preferable to cool in a refrigerator. In any event, when a temperature of about 175° F. is reached, there will result a plastic mass. By working this mass with a spoon or spatula, oil separation will be hastened. Better still, leave the mass until it comes to room temperature, when granular soap will separate, leaving clear oil which can be poured off. It is preferable to strain the oil through a cloth filter. A close weave of cotton sacking material has been found to make the best filter, giving a speedy filtration, yet delivering a clear oil.

By the first procedure outlined above; that is, working at about 175° F., almost twice as much oil is recovered as is true if the mass sets undisturbed until cool. However, the oil in the first case is liable to contain flocks of soap. In case these are evident, reheating to 300° F. and cooling again will cause the soap to coagulate and settle. To assure a final oil free from soap and lime, the oil is centrifuged before any characteristics are determined, using 100-cc. tubes. In most instances, no sediment is obtained on centrifuging.

It may be found that some variation of this general plan will give best results for others. The added lime no doubt has two or three functions and this lime addition can be varied as to amount in most greases. It is believed that the added lime will saponify any free fatty acids and part, if not all, of the free fat which may be in the grease. Further, this deficiency in free fat or fatty acids will cause greater syneresis than otherwise. By using several times as much added lime as is recommended, a cloud in the oil generally results. The same condition has been found when oils alone are heated with hydrated lime to 300° F. and then cooled. The addition of 0.1 to 0.25% of filter cel, both to the grease and to the oil before filtering, has been tried as an additional aid in settling the soap. This seems to offer promise.

AS to the limitations and merits of this method, it provides a quick method for the separation of oils from lubricating greases, particularly those containing light colored and low viscosity oils. As will be noted from tables following, oils separated by this method check closely in viscosity with those separated by the standard ASTM method. In most cases, the rapid method recovers an oil somewhat lighter in color than the standard method. The darkening by the latter method may be due to the action of hydrochloric acid or more probably to heating to drive off solvent. Of course, in this more rapid method there is a saving due to no use of solvents but the fire hazard due to their use is removed. Little glass apparatus is used with a consequent saving in breakage. Where fillers such as graphite are present, they are carried down by the mass of soap.

No doubt most laboratories have had customer complaints to the effect that the mineral oil in a grease shipment is not according to specifications. In some such cases, even though the standard ASTM method was followed, the following errors were found — incomplete soap decomposition by acid with consequent high viscosity report on oil; solvent left in recovered oil resulting in report of low viscosity; oil darker than specifications which was traced to excess heating to drive off solvent.

This rapid method and the ones following were devised to prevent the above discrepancies, if possible. At the same time, the saving in time is the biggest argument in its favor. It is doubted if most laboratories can complete a separation of lubricating grease by the standard ASTM method in less than five to six hours. With this rapid method they should be able to recover and test the oil in about one-fourth this time.

Naturally, this is not a quantitative method for mineral oil in lubricating greases. Further, it is not applicable to rosin greases. It will apply to greases made either

*Battenfeld Grease & Oil Corp., Kansas City.

SINCLAIR PENNSYLVANIA Motor Oil MELLOWED 100 MILLION YEARS

for Sinclair

A

4400 barrel LUMMUS BENZOL-KETONE Dewaxing Plant

For the Wellsville, N. Y. refinery of Sinclair Refining Company, Lummus is designing and building a 4400 barrel per day Benzol-Ketone dewaxing plant. » » » This — the eleventh Benzol-Ketone plant designed and built by Lummus within the last three years — is further evidence of the trend among progressive refining companies toward this method of dewaxing. » » » As designed and built by Lummus, Benzol-Ketone dewaxing plants have a number of advantages, particularly maximum yields of low pour oils from any stock, either distillate or residual. For refinery executives, we have some very interesting data.

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LUMMUS

PETROLEUM REFINING PLANTS

from fat acids or from whole fat. No work has been done with greases with added materials such as E. P. Bases. In the case of calcium greases of high soap content, such as No. 5 Cup, it is sometimes difficult to obtain oil separation by the rapid method. In such instances a small amount of solvent will leach out oil which is afterwards reheated and filtered.

Of course, the same procedure is applicable to smaller quantities of grease where the final viscosity determinations are made by the suspended-level or modified Ostwald viscosimeter.

Those not familiar with this method will no doubt wonder what the effect of small quantities of impurities may be on the recovered mineral oil. Therefore, impurities, such as might be expected, were added to three representative mineral oils and comparative viscosities determined. In each instance, the added material was heated with the oil to 300° F., cooled to room temperature and centrifuged before viscosity determinations were made. The results follow in Table I.

TABLE I

Saybolt Viscosities on Straight and Compounded Mineral Oils

Oil or Compound	Saybolt Universal Viscosities	
300 vis. @ 100° F. Oil	325 @ 100	142 @ 130
300 vis. plus 2% 42 Titer Fat	317 @ 100	139 @ 130
300 vis. plus 2% 38 Titer Fat Acids	310 @ 100	138.5 @ 130
300 vis. plus 1% Lime	327.5 @ 100	141.5 @ 130
300 vis. plus ¼% NaOH & 1% Water	324 @ 100	141 @ 130
2000 Texas Oil	87 @ 210	....
2000 plus 2% 42 Titer Fat	84.5 @ 210	....
2000 plus 2% 38 Titer Fat Acids	83.5 @ 210	....
2000 plus 1% Lime	87 @ 210	....
2000 plus ¼% NaOH & 1% Water	86.5 @ 210	....
160 Bright Stock	165 @ 210	....
160 plus 1% 42 Titer Fat	163 @ 210	....
160 plus 1% 38 Titer Fat Acids	162 @ 210	....
160 plus 1% Lime	165.5 @ 210	....
160 plus ¼% NaOH & 1% Water	164.5 @ 210	....

It is felt that the above additions are much above the possible percentage likely to be encountered in oil recovered by the proposed method. Hence, it is reasonable to conclude that close checks may be expected by this method with the oil actually entering the particular grease. This is borne out by Table II showing representative results obtained by the rapid method and by the standard method on the same grease samples.

TABLE II

Saybolt Universal Viscosities of Oils Separated from Calcium Lubricating Greases

Type of Grease	ASTM Method	Rapid Method	Ash %
Air Drill	473 @ 100	471 @ 100	0.01
Cyl. Stock Chassis	160 @ 210	161.5 @ 210	
		161 @ 210 (0.2% filter cel used)	
Chassis Lubricant	583 @ 100	588 @ 100	0.03
		586 @ 100 (02% filter cel)	
F. A. Gun	301 @ 100	303 @ 100	0.01
Graphite Cup	299 @ 100	300 @ 100	0.004
No. 3 Cup	328 @ 100	334 @ 100	....
Gun	303 @ 100	305 @ 100	....
No. 4 Cup	91 @ 100	87.5 @ 100	
		87 @ 100 (no extra lime added)	
No. 4 Cup	140 @ 130	137 @ 130	0.06
No. 3 Cup	296 @ 100	308 @ 100	....
Dark Gun	90 @ 210	93 @ 210	....
Crank Pin Cup	301 @ 100	314 @ 100	0.07
Cyl. Stock Chassis	81 @ 210	84 @ 210	0.09

For the rapid separation of mineral oil from soda base greases, we depend on the solubility of the soap in water. By carrying out a boiling process in the proper manner it is surprising how rapid and accurate results can be obtained on the oil component of a grease.

In detail — about 200 to 300 grams of the lubricating grease is placed in a three to four-quart flat pan, together with 1200 to 1500 cc. of boiling water. Boiling is continued until the grease is decomposed and a clear layer of oil appears on the surface. The water is then siphoned off and boiling repeated with fresh water. After ten to 15 minutes this water is removed and fresh added. This procedure is repeated until the wash water on cooling remains clear. Normally four boilings will free an oil of low viscosity from soap, while a heavy oil will require twice this number. It is preferable to make the final separation in a separatory funnel and follow by centrifuging. If the oil is not perfectly clear it should be heated above 212° F. until dry. During the last boiling the addition of 5 cc. of acetic acid will decompose any soap remaining. Further, the addition of a small amount of alcohol to next to the last wash may assist in obtaining a clear oil.

The success of this method depends largely on very intimate contact of the oil with the water. By using a wide pan so that a thin layer of oil is present, this condition prevails. If this method is used it will be found convenient and time-saving to have an abundant supply of boiling water on hand.

As with calcium greases, this method is not quantitative. Also, neither method provides for separation of oils from mixed calcium and soda greases. Of course, the most satisfactory results are obtained with low viscosity oils but heavy oils do not offer any more trouble than by the standard method and possibly less.

That satisfactory results can be obtained on oils separated by this rapid method is shown in the following Table III:

TABLE III

Saybolt Universal Viscosities of Oils Separated from Soda Base Greases

Type of Grease	ASTM Method	Rapid Method	Ash %
No. 2 Sponge	140.5 @ 130	140 @ 130	....
Wheel Bearing	369 @ 100	370 @ 100	....
Wheel Bearing	75 @ 210	82 @ 210	0.09
Universal Joint	92 @ 210	95 @ 210	....
No. 3 Sponge	340 @ 100	347 @ 100	0.036
No. 3 Sponge	307 @ 100	310 @ 100	....

For the rapid separation of oil from aluminum base greases, the aluminum soap is converted to soda soap and then dissolved as is done with regular soda greases. About 200 to 300 grams of aluminum grease is heated with 20 to 25% of its weight of 35 to 40 Be' caustic soda solution. Heating should be in an Erlenmeyer flask to prevent danger of spattering. It is essential that the caustic solution be mixed very thoroughly with the grease during heating, which should consume at least three quarters of an hour. Following this heating the flask is filled with water when a cake of oil and soap will result in a body of caustic water. The latter can be poured off.

A further report on the proceedings and discussion at the annual convention of the National Lubricating Grease Institute at Chicago Oct. 3 and 4 is to be found on page 25 of this issue.

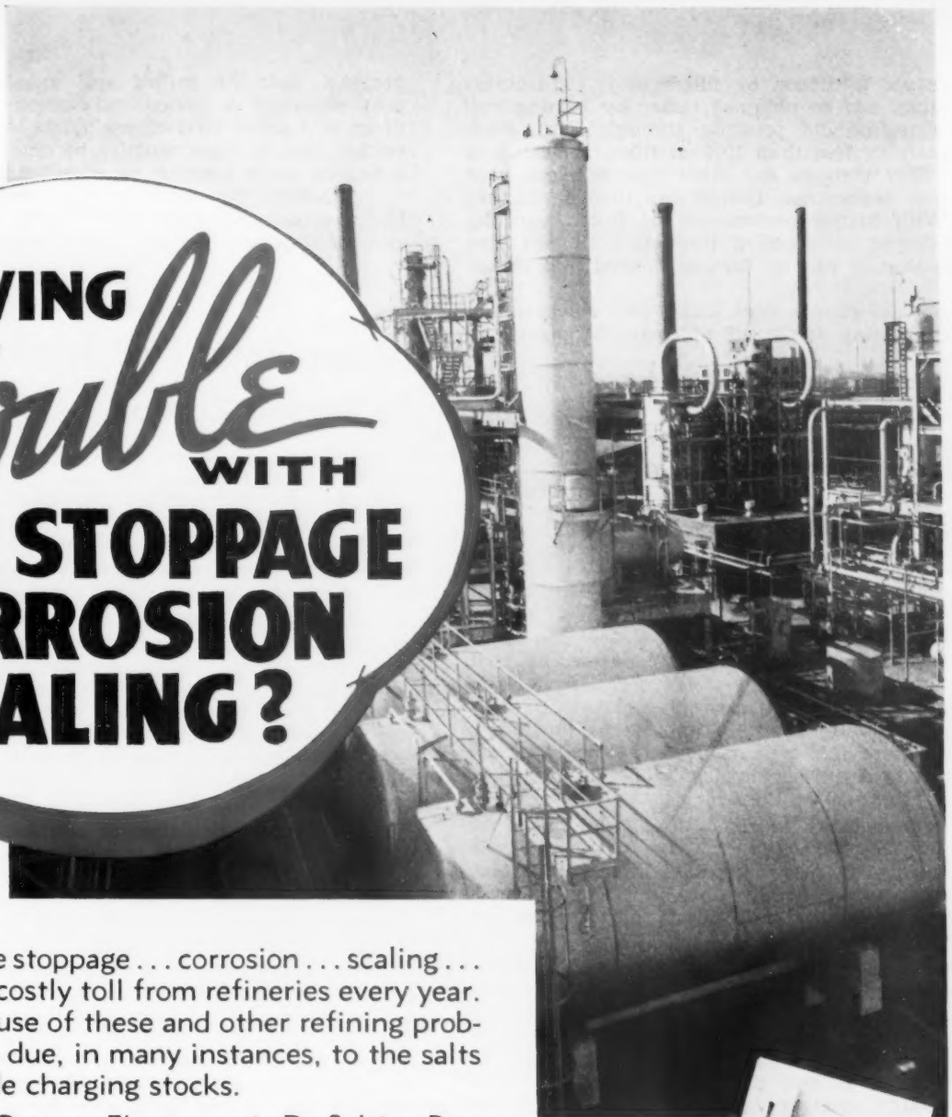
If very quick results are desired, boiling with water can be carried out at once. If not, by the following morning considerable clear oil will have separated from the cake in most instances. In any event, the oil must be freed from soap by boiling with water as is done in the case of soda base greases before it is used for testing.

While this method is successful with strong caustic solution, it is not dependable with weaker solutions. Apparently sodium aluminate is formed and, of course, the fat acids set free are converted to soda soap. While this involves two steps, it is found that the method consumes less time than the regular ASTM method where characteristics of an oil in an aluminum grease are desired. That the method compares favorably with the standard method is shown by the results in Table IV:

TABLE IV

Saybolt Universal Viscosities of Oils Separated from Aluminum Base Greases

Type of Grease	ASTM Method	Rapid Method
Gun	274 @ 100	262 @ 100
Rocker Arm	183 @ 210	189 @ 210
Chassis	111 @ 210	115 @ 210
Chassis	128 @ 210	131 @ 210
Chassis	94 @ 210	99 @ 210
Gun	298 @ 100	299 @ 100
Gun	287 @ 100	284 @ 100



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Oil in greases thickened by fillers only, as asbestos tractor lubricants, can be obtained either by heating and filtering or warming and pressing through cloth. Such lubricants containing less than 10% of filler, if heated to 300° F., will filter through the same type of cloth used for calcium soap separation. The oil can then be further centrifuged. With higher percentages of filler, warming to 125° F. followed by pressing through cloth will give enough oil so that it can be further filtered and centrifuged.

This method, of course, does away with solvents and with prolonged heating of the oil which might change its characteristics.

Grease Test Machine Yields Essential Service Data

Tests on anti-friction bearing greases described at the recent meeting of the lubricating grease institute in Chicago by Gus Kaufman of Beacon, N. Y., of The Texas Co., indicated, contrary to what might be expected, that the tendency of a grease to become softer on working down bears no relationship to leakage tendency. His data showed also that milling a grease imparts no advantage in performance since this process does not, as has been assumed, impart to a grease the final worked consistency to be expected after use in the bearings.

The testing apparatus which Kaufman described has been in use by The Texas Co. for five years and was said to be capable of measuring all of the important characteristics of torque, temperature and leakage tendency which make up the criteria of performance of greases in anti-friction bearings.

The machine consists essentially of a horizontal motor drive shaft capable of speeds from 36 to 1750 r.p.m., means for securing the inner race of the bearing to the shaft, and a housing designed to simulate clearances in practice. The housing, split in a plane perpendicular to the shaft, is attached to a torque arm transmitting forces opposing the shaft torque to a platform scale. The entire bearing assembly is enclosed in an insulated chamber through which brine or steam may be circulated in copper tubing to provide any desired temperature. Provision for catching leakage is made by a cup arrangement on the inner half of the housing. Temperatures are measured by a thermocouple contacting the outer bearing race through the housing.

Standard runs are made in two hours. The starting torque is obtained by noting the deflection of the indicating arm as the motor starts. Readings of torques and temperatures are made every minute for the first 30 minutes, since the torque drops rapidly in the first few minutes, and for the remainder of the test readings are taken every five minutes. Consistency measurements are made by a special miniature penetrometer which requires only 3 to 5 grams of grease.

Several tables of results were presented to show the results obtained with the test machine. One table showed the effect of distortion. It was shown that the differences in torque and temperatures are considerable when distortion is caused by forcing the bearing too tightly on the shaft or cramping it in the housing.

It was shown that the entire loss of grease (57.5%) thrown from the bearing into the retaining housing occurred in one series of tests during the first 10 seconds of operation. It was found that there is no particular advantage in increasing the charge to the bearing since this only increases the starting torque and running temperatures and may even cause less grease to remain on the bearing. With large amounts of grease there is a tendency for the grease to be thrown from the bearing with possible leakage occurring.

Tests on consistency showed that with softer products no leakage occurred, temperatures were lower, and, contrary to expectation, more grease remained on the bearing. Data on milled and unmilled grease showed that although a grease may show a definite working down to a softer consistency by the A.S.T.M. worked penetration test, it may actually become harder after use in a ball or roller bearing, whether milled or unmilled.

Although the machine was designed primarily for testing greases, it may also be used to compare performance of different ball and roller bearings.

Revise Motor Fuel Work In Second Edition

The second edition, Volume 1, of Nash and Howes "Principles of Motor Fuel Preparation and Application" was published recently and Volume 2 is promised shortly. Volume 1 deals with the production of motor fuel by the various refining processes, while Volume 2 will be concerned with the properties and tests of motor fuel.

Since the publication of the first edition of the book in 1934 rapid advances in refining methods have outmoded the earlier edition making necessary revisions and additions to the work, according to the authors, A. W. Nash and D. A. Howes. A new chapter on pyrolysis and polymerization processes has been added, while the latest developments in other fields have been dealt with in the appropriate chapters.

Written for the layman, the authors point out that the chapters on the distillation of petroleum to produce motor fuel, the refining of this to meet market demands and the development of the cracking and hydrogenation processes should bring home to him the vast work and capital expenditure involved in maintaining at service stations a standard supply of motor fuel.

The writer finds in the book more of a student's textbook requiring a year or so of college work along chemical engineering lines for appreciation. In this capacity and for the information it may provide to many who are capable of grasping the fundamentals of refining problems from an elementary chemical engineering standpoint, it is a valuable work. The book goes beyond refining methods common in this country, however, and gives attention to hydrogenation of coal, to benzol, alcohol and synthetic fuels, further to storage, distribution, and insurance.

Volume 1 contains 628 pages. A. W. Nash, one of the authors, is professor of petroleum technology, University of Birmingham, and vice president of the Institution of Petroleum Technologists. The book is recommended in a foreword by A. E. Dunstan, well-known British petroleum technologist, who stated that "the authors have presented a work . . . that contains not only very complete descriptions of present-day technique but includes also discussions of problems that will undoubtedly arise in the future."

New Clue To Crude Origin

A new clue to the long-standing hypothesis that crude oil was formed from plant life is announced by William C. Darrah, Harvard University biologist. Mr. Darrah ran across what he claims to be a 200,000,000-year-old fossilized first cousin to the present-day common ground pine enclosed in carboniferous rock. The fossil, said to be the most perfect ever discovered, was found near Mazon Creek in Grundy County, Ill.

Original oils of the plant, Darrah explained, were preserved in a hardened state through hydrogenation, and these formed a transparent casing for the plant's delicate structures. In ordinary plant fossils, preservation of details is very crude at best.

It will be on these fossilized oils, the biologist said, that scientists will now train their microscopes to test whether plant oils are an important source of natural petroleum, as many geologists have long believed.

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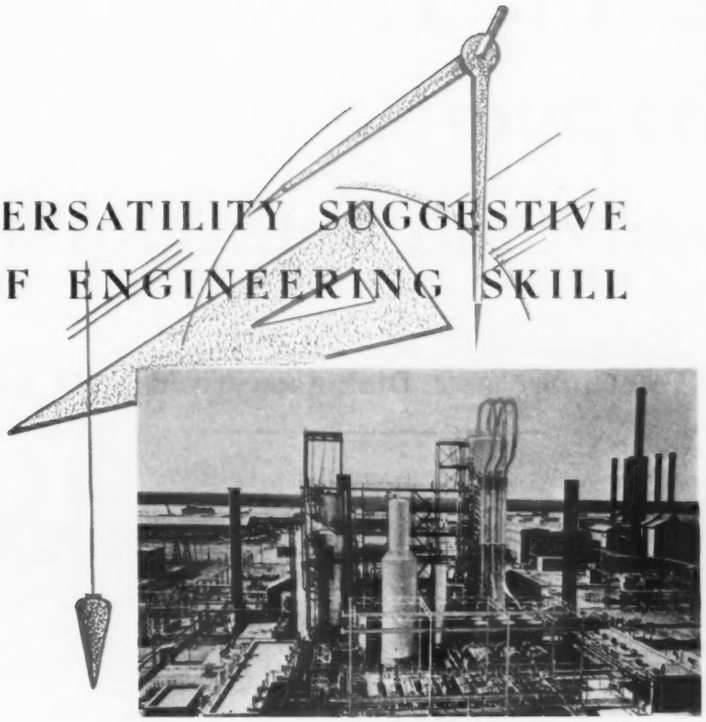

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Application of Propane to Manufacture Of Pennsylvania Lubricating Oils

753.2
729.9

By W. B. McCluer,* J. T. Dickinson** and H. O. Forrest**

● **Changes in the competitive situation and in the average viscosity of motor oils have adversely affected the status of the refiner of Pennsylvania lubricating oils.**

To correct the situation it appears advisable to install new processes which will reduce costs, improve quality, and produce an increased amount of effective neutral from the crude.

Propane dewaxing and deresining have been shown to reduce manufacturing costs, to increase the amount of effective neutral, and to prepare stocks for efficient single solvent treatment.

DURING the past 15 years a number of changes have been taking place which have seriously affected the position of the refiner of Pennsylvania crude. Most of these changes have resulted not from any action of the Pennsylvania refiner himself, but from developments in the petroleum industry outside the Pennsylvania field and from changes in design of automotive equipment in which most lubricating oil is used. Before discussing the application of propane processing to Pennsylvania oils, it is helpful to review briefly these changes in order to realize what is required to meet them and to understand the ways in which propane may be used to accomplish these results.

The first, and probably the most important, change that has taken place is the recognition of the high quality of Pennsylvania oil and the development of processes applicable to other and less expensive crudes which would enable them to approach this quality. Prior to 1925, petroleum technologists were in considerable disagreement as to the relative qualities of lubricating oils produced from crude oils from various sources. The consuming public, on the other hand, was apparently convinced that lubricating oils produced from Pennsylvania crude were premium products and were worthy of a reasonable price differential.

During the period from 1925 to 1930, petroleum technologists came into fairly universal agreement that the lubricants produced from Pennsylvania crude were definitely superior to lubricating oils then being produced from most other crudes. Once such an agreement was reached, it was only a relatively short period of time until improved lubricants approaching Pennsylvania oil quality were being produced from inferior crude oils.

Many Pennsylvania refiners will remember the developments of the past two decades in which most light oil products from Pennsylvania crude, originally considered of superior quality, became strictly competitive with similar products from other crudes. During the last six to eight years they have seen a similar trend in the case of lubricating oils produced from Pennsylvania crude, and while the trend with lubricants will probably not continue to the point reached in the case of light oils, the latter serves as a parallel which the Pennsylvania refiner should keep in mind when considering future operations.

There can be no reasonable doubt but that some lubricating oils produced by modern refining methods from inferior crude sources have already approached conventional Pennsylvania quality. As a result of this change, the refiner of Pennsylvania crude is finding profitable marketing of his oils a greater problem.

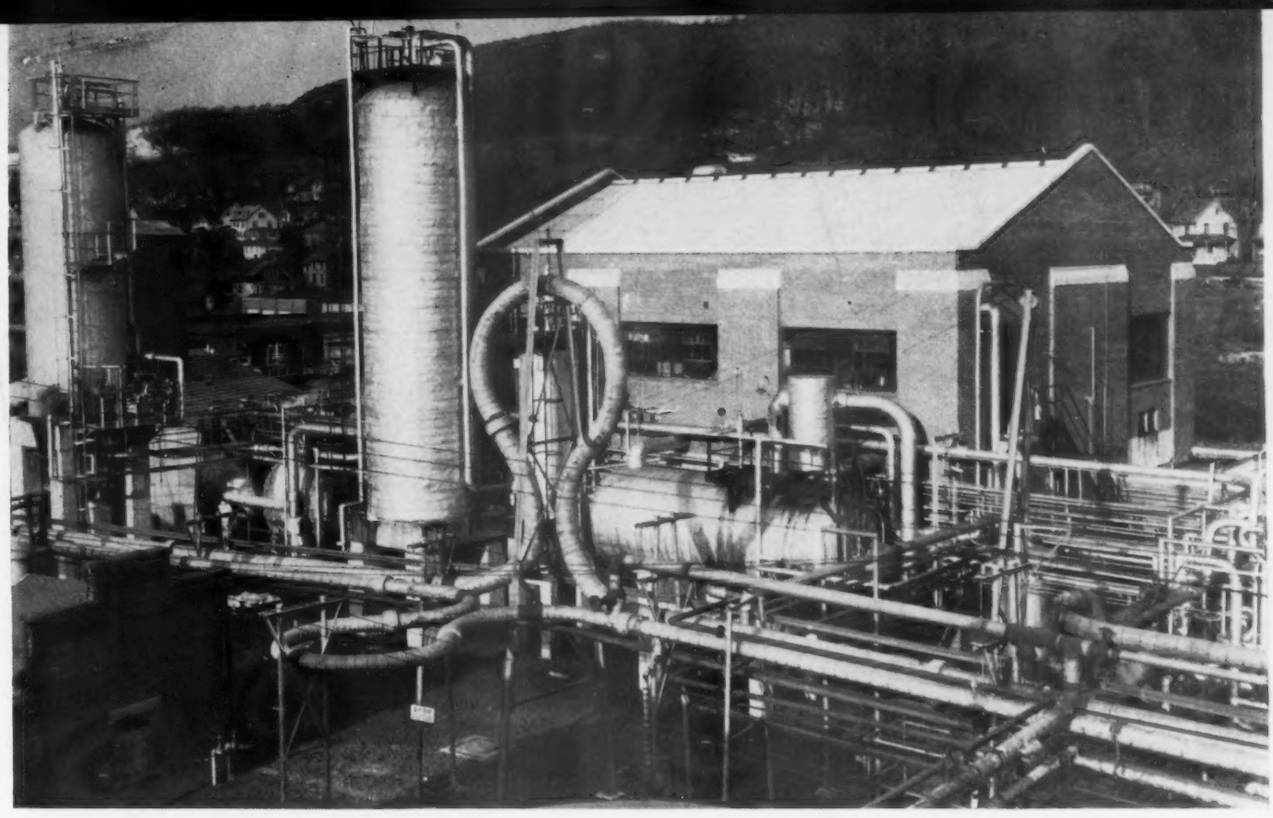
The second important change has been in the increasing demand for lighter motor oils. Several years ago, the average oil used in motor cars was heavier than an S.A.E. 30 grade, with relatively large consumption of the S.A.E. 40 grade. Over a period of only a few years the average viscosity requirement has decreased until it is now approaching the S.A.E. 20 grade with considerable demand for lighter oils. One way of visualizing this change is in the relative demands for 180 viscosity neutral and for 150 viscosity bright stock, which are the usual blending stocks in the Pennsylvania refinery.

S late as 1932 the motor oils produced in one refinery required only 45 per cent of neutrals while in 1937 they required 65 per cent of neutrals. For every 100 units of neutral available in the crude the Pennsylvania refiner was able to utilize 122 units of bright stock in 1932 while in 1937 the same amount of neutral enabled him to dispose of only 54 units of bright stock in his blended motor oils. In other words, this change in motor oil requirements has reduced the bright stock utilization in motor oil blends by about 55 per cent. From the same amount of crude processed, or for the same quantity of neutral and blended motor oils made, the amount of surplus bright stock has been greatly increased and now represents a very serious problem.

The third change which has been taking place, and which is still in progress, is in the motive power which uses the major portion of lubricating oils. Recent trends in automotive and aeronautic engines have placed internal combustion engine lubricants under a much more severe duty than has ever been imposed in the past. This trend cannot be offset entirely by improvement in engine design, since it is largely the result of producing a greater horsepower output from a given engine displacement, which naturally results in appreciably higher operating temperatures and pressures.

For this reason, oils which were satisfactory for

*The Kendall Refining Co., Bradford, Pa.
**The M. W. Kellogg Co., New York, N. Y.



Insulated vertical chilling towers in the Kendall unit. The continuous filters of the rotary drum type are installed in the building in the background

severe duty a few years ago are no longer entirely satisfactory for present day engines. The trend in engine manufacture at the present time seems to be to take maximum advantage of the highest lubricating oil quality which is available, so that motor oils which were entirely adequate a few years ago are now reaching the limits of their applicability. This limit may be in several characteristics, but the general tendency is to consider oxidation and sludge formation as extremely important factors, and also to consider many others which were not considered of serious consequence only a few years ago. This change has not greatly affected the Pennsylvania refiner so far, but it is one which he should evaluate thoroughly in planning for the future.

A consideration of these changes and their probable effects make it quite evident what the general corrective measures should be. If Pennsylvania refiners are to compete successfully with improved oils from lower cost crudes, they must be prepared either to offer equivalent quality at competitive prices or to justify a higher price by giving still better quality. To compete directly on an equal quality basis the Pennsylvania refiner must reduce his costs so as to offset the effect of his higher priced crude and the use of new and more economical methods by the refiners of other crudes, while to justify an appreciably higher price he must further improve the quality of Pennsylvania oil so as to reproduce the quality differential which previously existed.

It is, of course, advisable to reduce costs in any event and it appears advantageous also to improve quality, since by so doing the Pennsylvania refiner would better the competitive situation and at the same time be able to meet the demand for improved oils which modern automotive engines require. In the same way that the Pennsylvania refiner was previously fortunate in having an oil of natural high quality, he is now fortunate in being able to start his improvement at this high quality level and thus economically reach a level not readily equalled by refiners of inferior crudes.

The problem of meeting the present lower viscosity requirement is clearly one of reducing the average viscosity of the total lubricating oil fractions but with a minimum decrease in total production. The elimination of a small amount of very viscous material is obviously the most satisfactory method of obtaining a minimum viscosity with a maximum yield. Such a step will reduce the amount of bright stock and particularly the ratio of bright stock to equivalent neutral.

It thus appears that the changes in the competitive situation and in the viscosity and quality of the oils required will seriously interfere with the profitable manufacture and marketing of Pennsylvania lubricants unless the Pennsylvania refiner improves this situation in the following three major aspects:

(1) By producing oils of still higher quality.

(2) By increasing the amount of effective neutral made and thus decreasing the ratio of bright stock to neutrals.

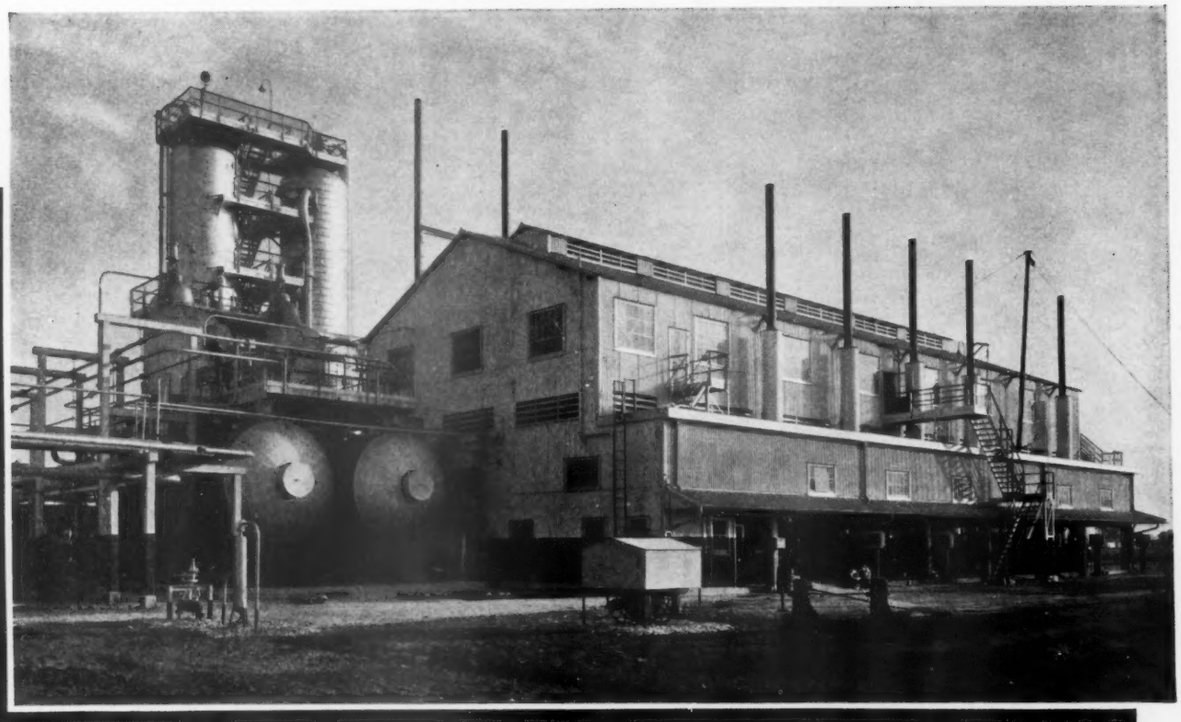
(3) By reducing processing costs.

These factors were all considered by the Kendall Refining Co. when they decided to install a propane dewaxing and deresining plant in their refinery at Bradford, in 1936. Some of the results of the early operation of that plant have already been discussed in a previous publication[1] and it is the purpose of the present paper to show further how the use of propane processing has helped them to improve their situation.

Improvement in Lubricating Oil Quality

It has been previously stated that lubricating oils of improved quality from inferior crudes are available today which approach the quality of conventionally refined Pennsylvania lubricating oils. These oils of the present improved quality can be produced in many cases more cheaply from crude oil obtained from other areas than oils can be produced from Pennsylvania crude. The above statement is true, of course, largely because of the cost differential which exists between Pennsylvania and other lubricating oil crudes. Assuming that this differential will remain, it is important to find some way

[1]Refining of Pennsylvania Oils by Propane Process; McCluer, Dickinson and Forrest, Oil and Gas Journal, March 31, 1938.



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of correcting this situation, even when the manufacturing cost is reduced to a minimum.

One such method would be to produce a still higher quality oil to give a greater safety factor in present engine design, and to permit even greater demand on the lubricant by future engine design. It is generally recognized that lubricants of even better quality than those now being used can be produced more economically from Pennsylvania crude than from other crude oils. This is true because the yield from other crude oils decreases very rapidly as the quality is improved above the present high quality range. Since Pennsylvania oils require only slight treatment to improve the quality, the decrease in yield is not such an important factor, and improved Pennsylvania oils should be able to justify a higher priced crude in the same way that they were able to do so when the quality differential was greater than at present.

The generally accepted method for improving the quality of Pennsylvania oils is solvent treatment, not only for increase in viscosity index, although that usually accompanies the treatment, but also for improvement in oxidation and sludging resistance and for reduction in carbon residue. It is not the purpose of this paper to compare the merits of the various solvent processes but only to indicate how propane processing may be utilized in conjunction with them. Because the value of propane in this connection is essentially restricted to residual oils, the discussion omits the question of solvent treating distillates, except as they might be included in long residuum refining operations.

The propane deresining process itself results in some improvement in quality because the heaviest ends of the cylinder stock are removed to produce a narrower cut bright stock. Elimination of the most undesirable heavy oil, and lowering the volatility and increasing the flash and fire points of the bright stock which results from this process, constitute improvements in quality. This improvement alone, however, is not all that is required to justify an appreciable premium for the bright stock.

The dewaxed and deresined oil from a propane plant may be treated directly with any desired selective solvent without loss of efficiency in the extraction process. There is really an advantage obtained by deresining in the case of single solvent treating, because the removal of a small amount of resins gives a saving in decolorizing costs even when solvent treating is practiced.

More recently, it has been found that propane deresining has other advantages as a means of preparing residual stocks for efficient treatment with single solvents. It has been shown that a heavy resin fraction may be treated separately with a high solvent dosage and the less viscous deresined oil with a low solvent dosage, with a distinct advantage in both quality and yield as compared with treating the entire residuum as one fraction. The data presented in Figure 1 shows the results of separating the dewaxed oil into two fractions by deresining, treating and decolorizing each fraction separately, and blending the finished oils in the proportions in which they were produced. The 12.5 per cent resin fraction, having a viscosity of 1014 S.S.U. at 210° F. was produced in commercial operation at the Kendall refinery and the deresined oil which was produced simultaneously had a viscosity of 127 S.S.U. at 210° F. and a color of about 7 N.P.A.

The resin fraction was treated in a laboratory countercurrent tower with 338 per cent phenol and 9.7 per cent water was injected at the bottom of the tower for refluxing. The raffinate from this process was 75.9 per cent of the resin charge or 9.5 per cent of the original cylinder stock. This raffinate had a viscosity of 768 S.S.U. at 210° F. and a carbon residue of 3.5. It was then percolated in naphtha solution through Attapulgus clay to a color of 1 T.R., or about 8 N.P.A., with a clay yield of 3.2 barrels per ton. The finished resins then had a viscosity of 610 S.S.U. at 210° F. and a carbon residue of 2.4. Although this is an unusual product itself, it is of particular advantage when blended with the separately treated and percolated deresined oil.

The deresined oil was treated with only 84 per cent solvent as compared with the 338 per cent used on the resins, and the yield was 95.8 per cent based on the charge, or 70.9% of the original cylinder stock. The viscosity was reduced only slightly (to 125.2 S.S.U. at 210° F.), while the carbon residue was reduced to 0.96. This raffinate was then percolated through Attapulgus clay with a yield of 40 barrels per ton, to give a color of 2¼ T.R., or about 6 N.P.A., and essentially no change in carbon residue.

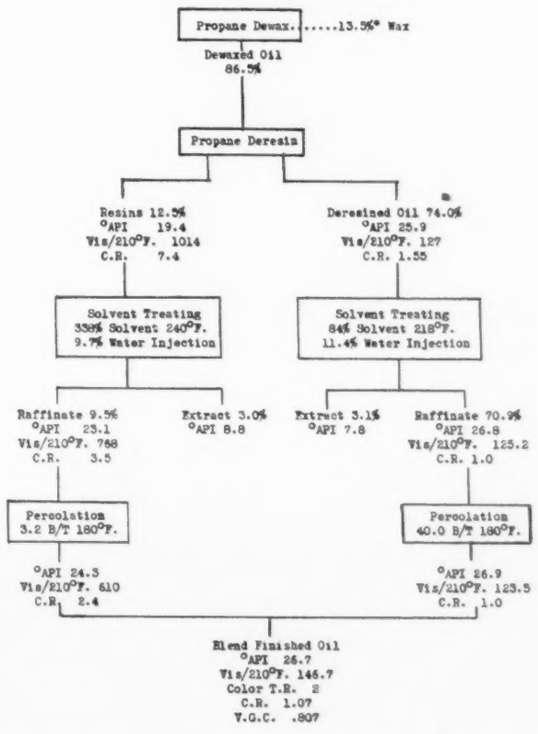
When these two percolated oils were blended in the proportions in which they were produced, the resulting oil corresponded to 80.4 per cent of the cylinder stock, the dewaxing loss having been 13.5 per cent and the loss to extract by solvent treating 6.1 per cent. The finished oil had a carbon residue of 1.07, which is less than 0.75 per cent of the viscosity at 210° F., and the V.G.C. was 0.807. It is particularly noteworthy that the heaviest 12 per cent of the finished cylinder stock has a low carbon residue for the viscosity and a viscosity-gravity constant which is better than that of the main portion of the bright stock.

Adoption of propane deresining followed by solvent treating thus permits any degree of refinement on the heavy and lighter fractions of the bright stock. For example, the propane deresining step may be carried out to produce only 3 to 5 per cent of resins and the deresined oil may be finished by percolation alone as is the usual practice at the Kendall refinery. On the opposite end of the scale, it has been demonstrated by pilot plant operations that it is possible to precipitate as much as 30 to 40 per cent of resins and treat them with a large quantity of solvent, while the deresined oil simultaneously produced may be used directly or may also be solvent treated to any desired degree. Between these limits a wide variety of combinations are possible which permit the refiner to take care of market demands and fluctuations in crude and product prices.

Propane deresining, therefore, does give improve-

Figure 1

PROCESSING BRADFORD CYLINDER STOCK



* All percentages are volume per cent.

ment in some characteristics, and also serves as a means of preparing residual stocks for most efficient treatment with selective single solvents.

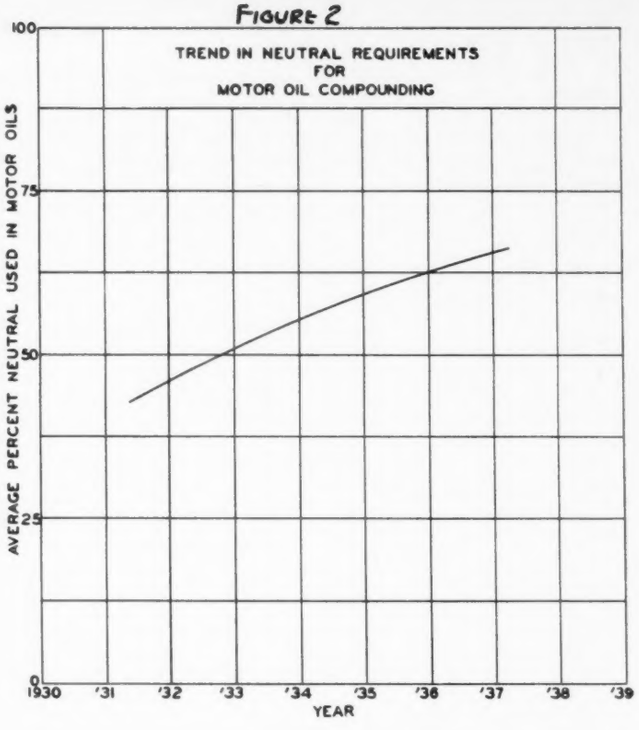
Reduction in Viscosity (Bright Stock-Neutral Ratio)

The yield of neutral and bright stock obtained from Pennsylvania crude oil depends to a considerable extent on the particular area from which the crude is obtained, on the specifications of the finished product, and on the refining methods employed. It is probable that the average yields of neutral and bright stock obtained from Pennsylvania crude oil are approximately 6 to 7 per cent and 15 to 17 per cent respectively. In general the ratio of bright stock to neutral is about 2.5 to 1, or to state it differently, the neutral is about 29 per cent of the total lubricating oil produced from Pennsylvania crudes.

As pointed out previously, there has been a gradual decrease in the average viscosity of lubricants required for automotive engines. Considered from the viewpoint of neutral requirement, this trend is shown graphically in Figure 2. The increase in neutral requirement from 45 per cent of the motor oil blends in 1932 to 65 per cent in 1937 is of even greater significance than these figures would imply at first glance. The limitation in crude refining or production capacity, or both, may prevent a refiner from marketing as much blended motor oil as he might wish. For example, a refiner processing 5000 barrels per day of crude could finish about 300 barrels of neutrals or about 650 barrels of blended motor oils on the basis of the 1932 average viscosity. In 1937, however, the amount of neutral produced remaining the same, he could make only 460 barrels of blended motor oils, and would have 590 barrels of surplus bright stock as compared with a surplus of only 400 barrels in 1932. Surplus bright stock, over and above the amount that can be blended with Pennsylvania neutral for average motor oil requirements, now amounts to 80 per cent of the Pennsylvania bright stock that could be produced, or about 12 per cent of the total Pennsylvania crude processed.

The above facts indicate that the Pennsylvania refiner has a distinct need for processing methods which will permit him to produce larger quantities of neutral, or the equivalent, from the crude and at the same time reduce the quantity of bright stock. The present and relatively nonflexible yields which are obtained by conventional refining methods frequently result in the building up of huge bright stock inventories because the demand for neutral and lighter products dictates the quantity of crude run to stills. High stock inventories and reasonable margins of profit for refining do not generally go hand in hand.

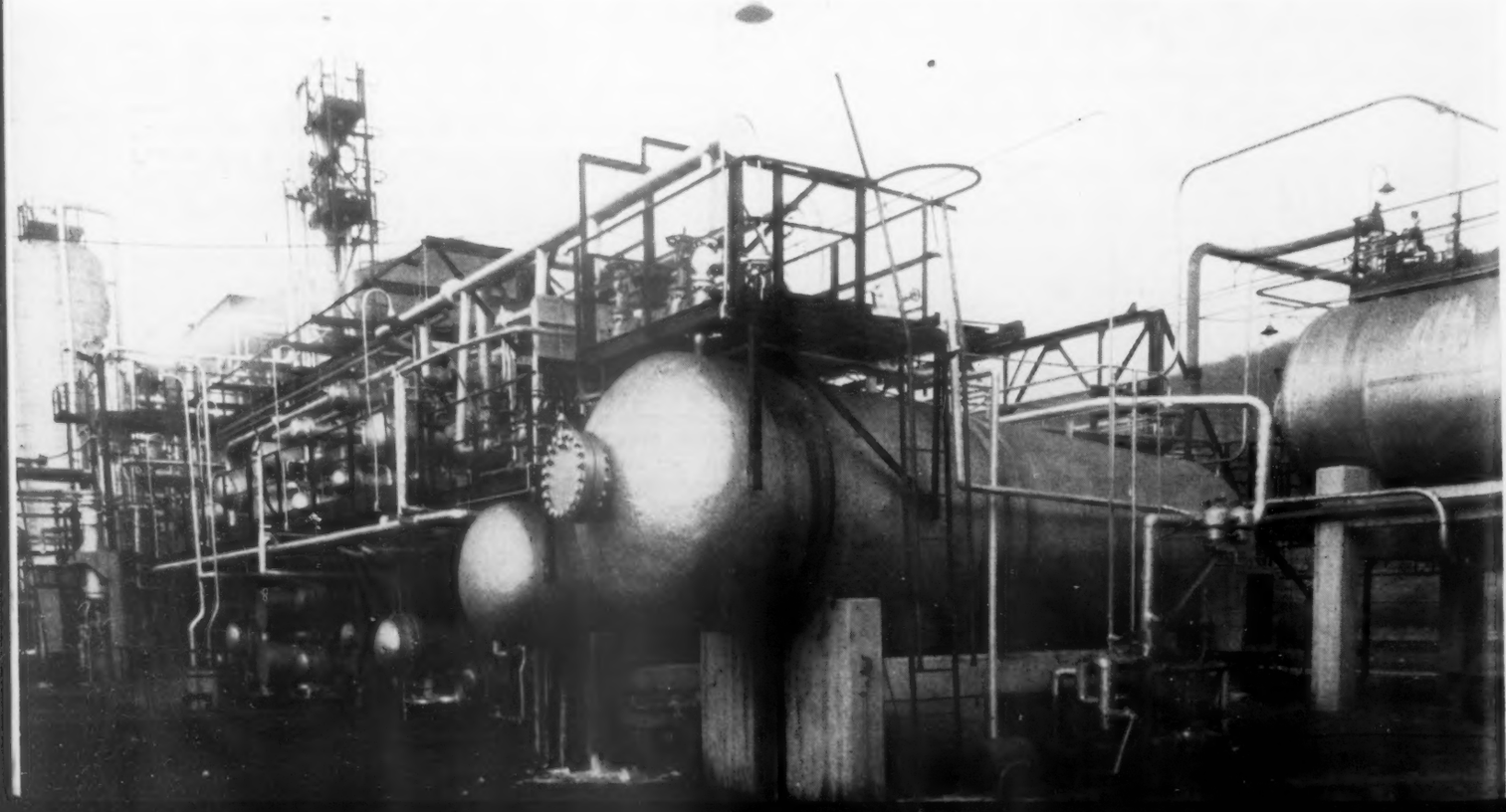
FIGURE 2



Larger quantities of neutral or distillate stocks may be obtained from the crude, of course, simply by distilling to higher viscosity cylinder stocks. This procedure, however, is not beneficial unless these heavier cylinder stocks can be finished to the normal 150 viscosity bright stock. If the viscosity of the heavier cylinder stock is not reduced in finishing there would be no net gain in neutral equivalent because all of the intermediate distillate would be required to adjust the bright stock viscosity. This distillation step would not be without complication because some type of solvent dewaxing process probably would be required to dewax the intermediate distillates.

Presumably two methods are available for produc-

Heat exchangers in background, and deresining drum, fore ground, in Kendall's propane dewaxing plant at Bradford



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ing 150 viscosity bright stock from higher viscosity cylinder stocks without resorting to thermal decomposition. These methods are: (1) Vacuum distillation (or its equivalent) where an overhead cylinder stock and very high viscosity fuel oil bottoms would be obtained, and (2) Propane deresining where 150 viscosity residual stock would be produced before or after dewaxing the high viscosity cylinder stock. Insofar as it is known, no distillation process has been developed which is entirely satisfactory from yield and economic viewpoints when reducing Pennsylvania residuum to less than 1 per cent of the crude. Propane deresining, on the other hand (especially if used in conjunction with propane dewaxing), has been shown to be satisfactory from both yield and economic viewpoints.

The propane dewaxing and deresining plant of the Kendall Refining Co. was originally operated on a cylinder stock having a viscosity of about 165 S.S.U. at 210° F., with the removal of about 3 to 5 per cent of very heavy resins having a viscosity of 3000 to 4000 S.S.U. at 210° F. Removal of this quantity of very viscous material (about 0.5 to 0.9 per cent based on crude) increases the equivalent neutral much more than the same amount, and has a rather surprising effect on the surplus bright stock.

In the first place, distillation of the crude to 165 viscosity instead of the normal 145 viscosity gives an intermediate waxy distillate cut amounting to 2.2 per cent of the crude. Approximately 85 per cent of this fraction is then obtained as zero pour test distillate after propane dewaxing, with a viscosity of 53 S.S.U. at 210° F. This represents an increase of dewaxed distillate yield of 1.87 per cent based on crude, which is about 30 per cent of the usual neutral production. Since this oil is slightly heavier than neutral, it cannot all be considered as a net gain, but it can be assumed to be a blend of 77 per cent of 180 viscosity neutral and 23 per cent of 150 viscosity bright stock, so that its neutral content is 1.43 per cent of the crude and its bright stock content is 0.44 per cent of crude. By distillation to 165 viscosity at 210° F., the cylinder stock was reduced from 19.5 to 17.3 per cent of crude and the actual bright stock was reduced from 16.0 per cent to 13.7 per cent of crude by the combined effects of distillation and deresining.

This method of processing, which was the one originally adopted by the Kendall Refining Co., increased the equivalent 180 viscosity neutral by 25 per cent and decreased the total bright stock by 12 per cent below that which would have been obtained by propane dewaxing alone without deresining. Actually the yield of total bright stock, including that in the intermediate distillate, remained almost constant as compared with conventional processing, because the increased dewaxing yield by propane dewaxing compensates for the lesser amount of cylinder stock made as well as for the removal of the very viscous resin fraction. Instead of a surplus bright stock of 80 per cent or more by conventional processing or by propane dewaxing without deresining, the surplus bright stock by this process is only 61 per cent.

Although the above operation represents a significant improvement in the ratio of neutral to bright stock, the method has been carried even further in more recent plant operations. The distillation step has been operated to produce 15.4 per cent of a 190 viscosity cylinder stock and 4.1 per cent of intermediate distillate which has a viscosity of 58 S.S.U. at 210° F. after dewaxing to zero pour test with a yield of about 85%. This distillate may be considered as 67 per cent neutral and 33 per cent of 150 viscosity bright stock, and the net increase in neutral yield is therefore 2.4 per cent of the crude or 40 per cent of the neutral from operation without deresining. At the same time the actual bright stock has been reduced from 16.0 per cent without deresining to 11.7 per cent of the crude and the total bright stock equivalent is 12.8 per cent of the crude. The neutral equivalent is thus increased by 40 per cent and the bright stock is reduced by 19 per cent from that obtained without deresining or by only 11 per cent from that obtained by previous processing methods. The surplus bright stock has been reduced from about 12 per cent to slightly more than 8 per cent of crude.

These results have been obtained when operating the propane dewaxing and deresining plant on the residual stocks of the above viscosities. No difficulties have been encountered in dewaxing and deresining any of the cylinder stocks which have been used, covering the range from 150 viscosity to 190 viscosity at 210° F. and pour tests from 0° F. to +20° F. Obviously, the yield of dewaxed and deresined oil decreases as the viscosity of the charge increases, because the high viscosity fraction must be increased to maintain a constant product viscosity of 150 S.S.U. at 210° F.

A comparison of the results of these methods of operation with those obtained by conventional processes is presented in Table I. In all cases the actual 180 viscosity neutral remains constant at 6.0 per cent of the crude, but as the viscosity of the cylinder stock is increased from 145 to 190 the amount of blended motor oil which can be produced from the crude increases from 9.2 per cent to 12.9 per cent. This increase of 40 per cent in blended motor oil production results from the elimination of only 1.4 per cent of the crude as very viscous material. This represents a net fuel production of only 0.8% of the crude when taking filter losses into consideration.

The effect of propane dewaxing and deresining on the distribution of products from the lubricating fraction of Pennsylvania crude is shown even more strikingly in Figure 3. Although the actual neutral remains constant, the equivalent neutral, above the dotted line, gradually increases from zero to 2.4 per cent as the viscosity of the cylinder stock increases from 145 to 190 S.S.U. at 210° F. The actual bright stock is decreased from 16.0 per cent to 11.7 per cent by the removal of intermediate distillate and heavy fractions, while the equivalent bright stock decreases from 16.0 to 12.8 per cent.

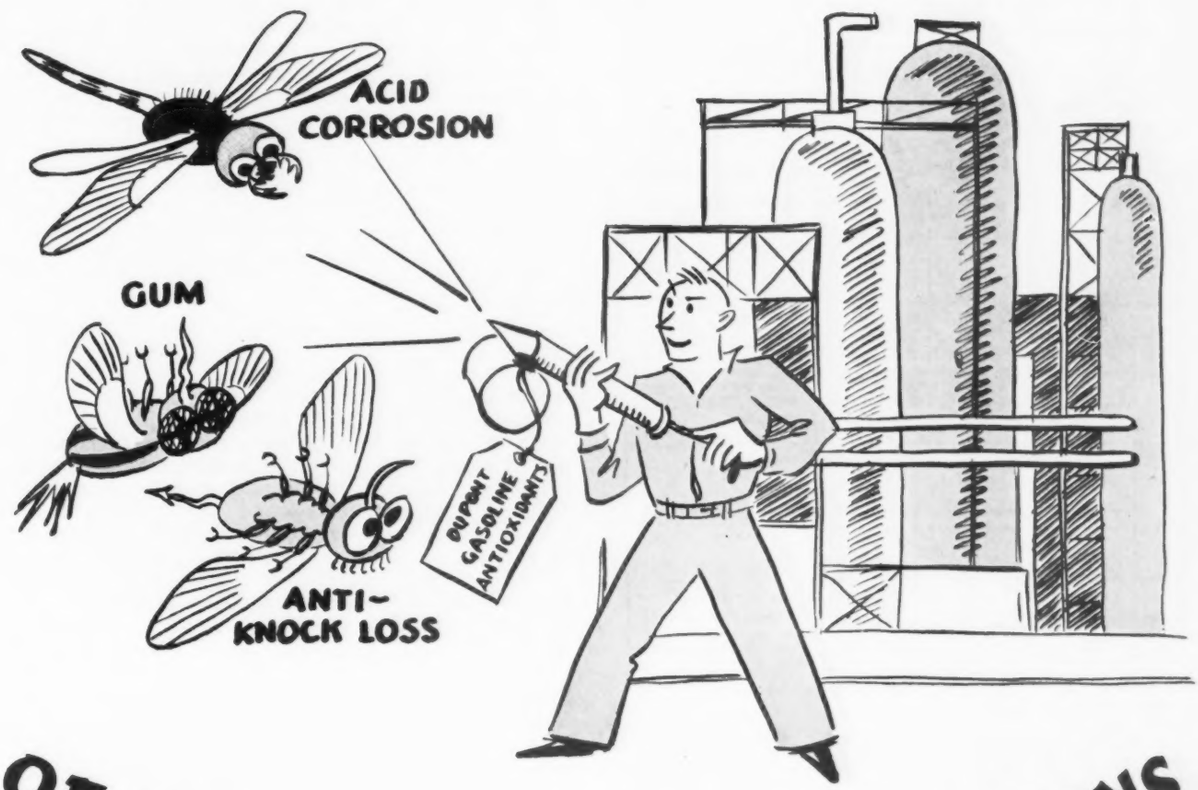
In order to show the net result of this method of processing, the total amount of blended motor oils which can be produced is represented by the distance above the dividing line between the shaded and unshaded portions. The excess bright stock is indicated by the height of the shaded portion of the figure. This shows quite clearly that excess bright stock decreases much more rapidly than the loss to heavy products increases. Over this entire range the net increase in fuel is only 0.8 per cent of crude, but the decrease in excess bright stock is 4.5 per cent of crude and the increase in blended motor oil is 3.7 per cent of crude.

These results may be presented still differently as in Figure 4, in which the ratio of finished bright stock to finished neutral is shown as a function of the viscosity of the residual stock charged to the propane dewaxing and deresining plant. The ratio as shown here is based on including the equivalent amount of bright stock and neutral which is present in the intermediate distillates. In the conventional processing of Bradford crude the

TABLE I
Effect of Processing Methods on Distribution of Products

	Using Conventional Methods	Using Propane Dewaxing	Using Propane Dewaxing and Deresining	
Vis. at 210° F. of Cylinder Stock	145	145	165	190
Cylinder Stock—% of Crude	19.5	19.5	17.3	15.4
Zero Pour Cylinder Stock—% of Crude	15.3	16.6	14.7	13.1
Resins Removed—% of Crude	....	....	0.7	1.4
Filtering Loss—% of Crude	0.8	0.6	0.3	0
Finished 150 vis Brt. Stk.—% of Crude	14.5	16.0	13.7	11.7
Zero Pour 180 vis Neutral—% of Crude	6.0	6.0	6.0	6.0
Intermediate Waxy Distillate % of Crude	....	....	2.2	4.1
Intermediate Zero Pour Distillate—% of Crude	....	....	1.9	3.5
180 Neutral Equivalent of Intermediate Distillate—% of Crude	....	....	1.4	2.4
150 Vis Bright Stock Equivalent of Intermediate Dist.—%of Crude	....	....	0.5	1.1
Total 180 Neutral or equivalent—% of Crude	6.0	6.0	7.4	8.4
Total 150 Bright Stock or Equivalent—% of Crude	14.5	16.0	14.1	12.8
Total Lube Made—% of Crude	20.5	22.0	21.6	21.2
Bright Stock Blended for Motor Oils—% of Crude	3.2	3.2	4.0	4.5
Total Blended Motor Oils—% of Crude	9.2	9.2	11.5	12.9
Bright Stock—Neutral Ratio	2.42	2.67	1.90	1.53
Surplus Bright Stock—% of Crude	11.3	12.8	10.1	8.3

KEEP THE "BUGS" OUT



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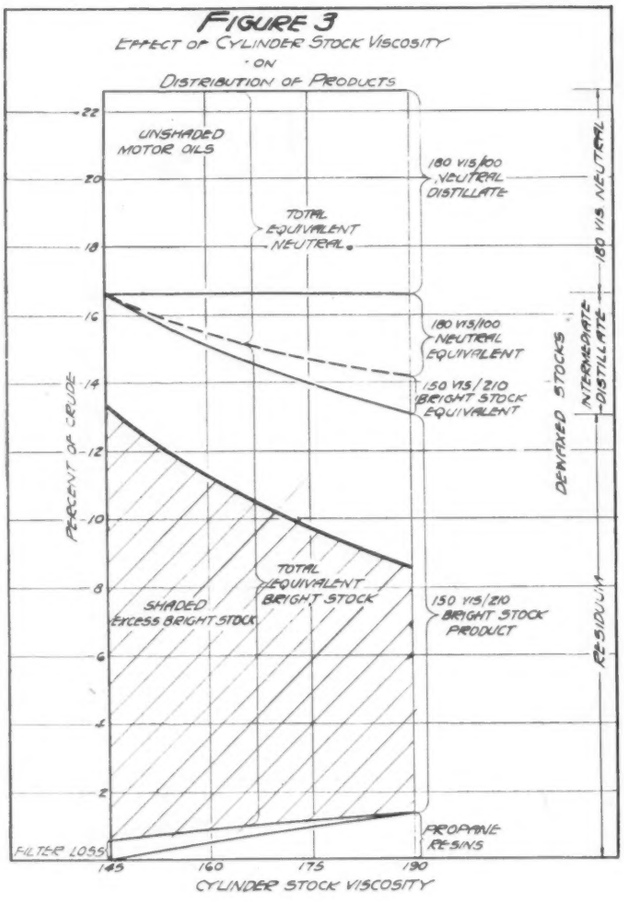


ratio of bright stock to neutral was approximately 2.5 to 1 as shown in Table I, while with propane dewaxing without deresining the ratio was 2.7 to 1. As the viscosity of the residual stock increased, the ratio decreased until it reached 1.5 to 1 at the maximum viscosity thus far used commercially, of 190 S.S.U. at 210° F.

One point, which may not be clear from the above discussion, is that the total lubricating oil yield is actually higher by this procedure than with the conventional process. For example, the total lubricating oil previously made was about 20.5 per cent of crude, 14.5% of which was bright stock. Even when the viscosity of the residuum charged to the propane dewaxing plant was 190 S.S.U. at 210° F., the total lubricating oil produced was 21.2 per cent or an increase of 0.7 per cent in spite of discarding a portion of the crude (about 1.4 per cent) as very viscous resins. This increase is of course due to the higher dewaxing yields and lower decolorizing loss, which more than offset the 1.4 per cent of the crude discarded. The net result of propane dewaxing and propane deresining is thus to increase the yield and decrease the average viscosity of the oils produced.

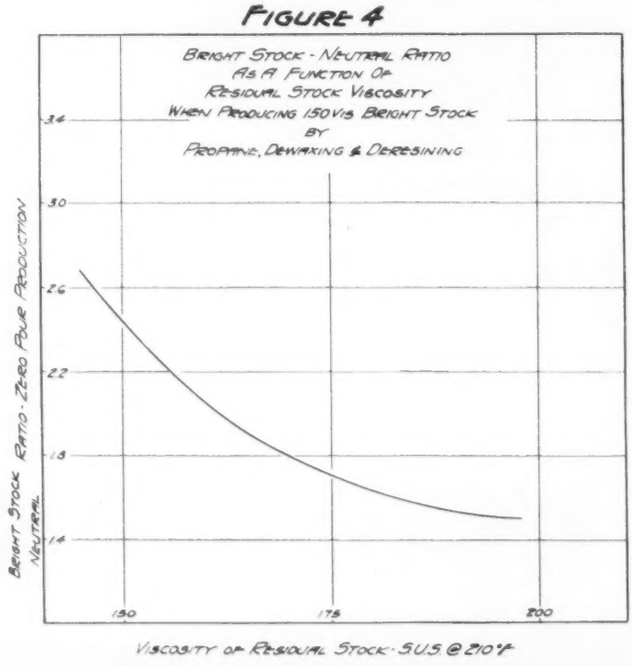
Although the method outlined above is now being used by the Kendall Refining Co. and represents a very satisfactory procedure for improving the ratio of bright stock to neutral, it is not the only way of accomplishing this result. Actually the amount of neutral in the crude is not increased by this process, and all improvement in the bright stock to neutral ratio is obtained by reducing the quantity of bright stock. Distillation to a more viscous residuum and processing of the stock to finish at 150 viscosity reduces the actual quantity of bright stock but increases the neutral equivalent only because the light fraction of the cylinder stock which would be required to bring the heavy resin fraction to 150 viscosity may now be removed from the bright stock and used separately or as a blending stock. In other words, discarding of a very viscous fraction releases the amount of neutral which would be required for blending with this fraction to obtain the usual bright stock viscosity of 150 S.S.U. at 210° F.

The same result, insofar as bright stock to neutral ratio is concerned, may be obtained by another method of operation employed by the Kendall Refining Co. and described in the previous paper. In this case the 157 viscosity cylinder stock was dewaxed and then deresined to remove 13% of heavy oil having a viscosity of 1151 S.S.U. at 210° F. The deresined oil in this case had a viscosity of 117 S.S.U. at 210° F. and represented 13.5 per cent of crude. When the plant was operated on the same charge stock to precipitate only 3.5 per cent of resins, the viscosity of the bright stock was 148 S.S.U. at 210° F. and it represented 15.3 per cent of the crude. The amount of 180 viscosity neutral required to bring the 148 viscosity stock to the average motor oil viscosity of 60 S.S.U. at 210° F. is 64 per cent of the blend, while to bring the 117 viscosity stock to the same viscosity blend the neutral required is only 58 per cent. The 6 per cent of neutral available in the crude could therefore be used to blend with 4.4 per cent of 117 viscosity bright stock instead of only 3.4 per cent in the case of 148 viscosity bright stock.

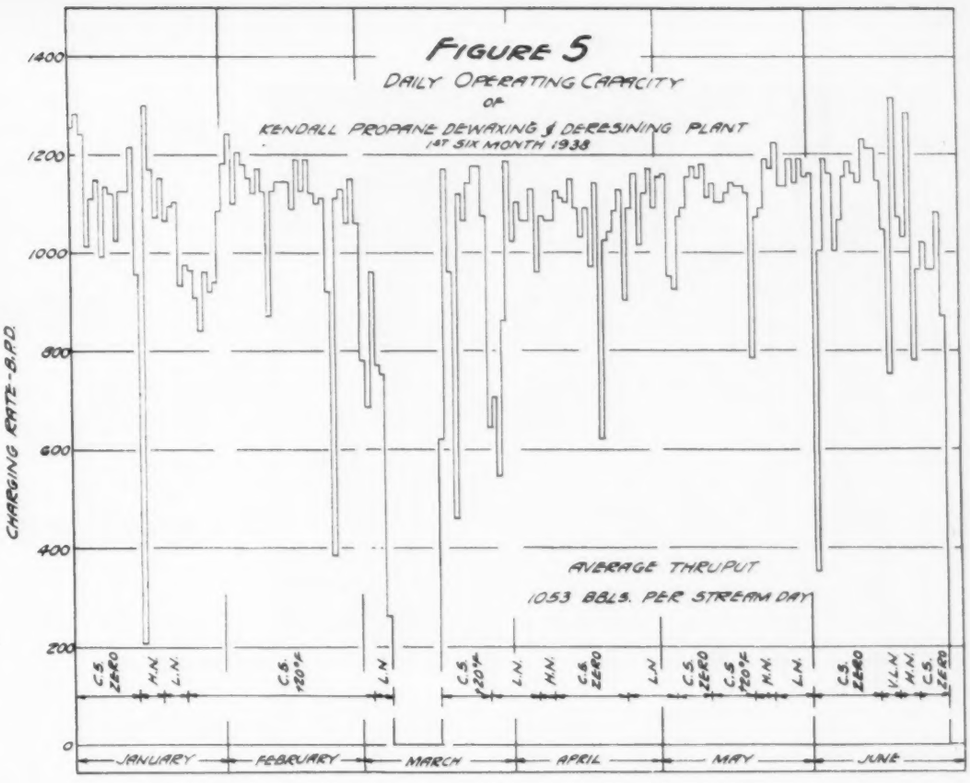
By this method, therefore, the blended motor oil is increased from 9.4 per cent to 10.4 per cent by the elimination of an additional 1.8 per cent of the crude processed in this manner. Since only 6.0 per cent of cylinder stock would be required to produce the 4.4 per cent of low viscosity bright stock for blending, the average amount of additional resins is only 0.6 per cent. The same general result is thus accomplished by this method of operation as when distillation to heavier cylinder stock is resorted to, although in the present case a portion of the gain is a result of reducing the quantity of bright stock and another portion is the result of the lower viscosity of the bright stock produced.

Of course it would not be possible to process all of the residual stock by this latter process, unless the excess 117 viscosity bright stock could be readily marketed. It is possible, however, to so process the bright stock used for blending purposes in the refinery, and to process surplus cylinder stock, to produce a marketable 150 viscosity bright stock while still taking advantage of deresining to reduce filtration costs on the latter stock. The net effect on bright stock to neutral ratio of producing a portion of the bright stock at low viscosity and a portion at normal viscosity would be essentially the same as for the method now employed by the Kendall Refining Co. of distilling a portion of the cylinder stock and processing the heavier residuum.

The above indicated processing methods might not



always prove economically desirable when bright stock is in great demand, unless reasonably valuable by-products could be obtained from the operations when a large amount of resins is produced. Plant operations have shown that the resins which have been produced by these processes may be converted to high viscosity specialty products by relatively minor changes which have now been made in the deresining portion of the plant. When the very high viscosity products are marketable as such, these operations are highly advantageous irrespective of the crude and product price structure. Even when the heavy products must be discarded as fuel, it is always possible to vary the amount of precipitation to maintain conditions which are optimum for any given economic situation.



Reducing Manufacturing Costs

In any consideration of manufacturing costs, it is desirable to confine the analysis within close limits to simplify comparisons insofar as possible without sacrificing accuracy. For this reason, it is advisable to compare the relative costs of producing lubricating oils by the older conventional methods with those by the more modern refining processes, after the crude oil has been subjected to its primary distillation and segregated into its component parts.

It should be pointed out that, in the case of almost all refiners of Pennsylvania crude, the only manufacturing costs which are involved in the production of lubricating oils are for two fundamental purposes; namely, dewaxing and decolorizing. Several different operations may be involved in the production of neutral from wax distillate and of bright stock from cylinder stock, but in the final analysis only two purposes have been accomplished — the raw stocks have been dewaxed and decolorized. Hence, the price differentials which exist between waxy neutral and dewaxed neutral, in one case, and between cylinder stock and bright stock, in the other case, are dependent only upon the costs of dewaxing and decolorizing the waxy neutral and cylinder stock, respectively. Fundamental consideration of the propane processes and practical operating experience with them at the Kendall Refining Co. have shown conclusively that significant reductions in manufacturing costs can be made by their use.

Propane can be applied by the Pennsylvania refiner to the reduction of manufacturing costs in three different ways. It can be used as a solvent and refrigerant for dewaxing distillate and residual stocks without deresining; it can be used as a solvent for deresining residual stocks before or after dewaxing by any process; or it can be used for carrying out both dewaxing and deresining operations in a single plant.

In considering the manufacturing cost for dewaxing alone, it is important to evaluate not only the major items of operating cost, utilities and labor, but also the increased yields which are obtained in the dewaxing operation and any changes which might affect subsequent decolorizing costs. The refiner installing a new dewaxing plant today should expect to make savings by reducing the cost of utilities and labor, by securing higher yields of dewaxed oil, and, if he selects propane dewaxing, by reducing the cost of subsequent decolorizing because propane has the ability to precipitate color bodies with the wax.

Operating data obtained at the Kendall refinery indicate that if propane dewaxing alone had been installed, the economies effected would have been sufficient to pay for the plant in approximately two years. Since increased yields and reduced operating costs alone would have permitted paying for the plant in about 2.6 years the difference shows the value of the decolorizing which accompanies propane dewaxing.

Uniform plant operation and consistently high yields are essential factors in manufacturing cost in any plant which is installed to serve a definite economic function. Daily throughputs obtained in the propane dewaxing and deresining plant of the Kendall Refining Co. during the first six months of 1938 are contained in Figure 5. These data show that, even though the plant charged a variety of different stocks, frequently for short periods of time, the throughput was essentially constant, the average capacity during the first six months of 1938 being 1053 barrels per stream day. During the past two months the plant has been operated on both distillates and residual stocks at throughputs which are 15 to 20 per cent higher than this average.

The dewaxing and deresining yields obtained during the first six months of 1938 are shown in Table II.

The flexibility of the propane dewaxing process, as shown by the capacity and yield data on various stocks, is an important item in manufacturing cost. Most of the yield and operating cost savings which may be credited to the new dewaxing processes for Pennsylvania oils result from improved operation on residual stocks. However, the consolidation of distillate and residual dewaxing plants in one unit results in quite definite savings in labor and maintenance and in fixed costs.

The ability of the propane dewaxing process to precipitate a portion of the coloring matter from the oil and reduce the decolorizing cost by about 30 per cent results in a reduction of the pay-off time for a 1000 barrel plant from about 2.6 to 2 years. Addition of a deresining step still further reduces this pay-off time by greatly reducing clay requirement with only a small decrease in finished oil production. Precipitation of about four per cent of resins increases the percolation yield by approximately 100 per cent and decreases the decolorizing cost proportionately.

Using the operations of the present plant as a basis, it has been estimated that a propane deresining plant (without dewaxing) for handling 1000 barrels of cylinder stock per day would show a pay-off period of about 1.8 years as a result of savings in the cost of decolorizing by removing about four per cent of resins. These resins cannot be debited against the process because experience has shown that a large part of the material removed by

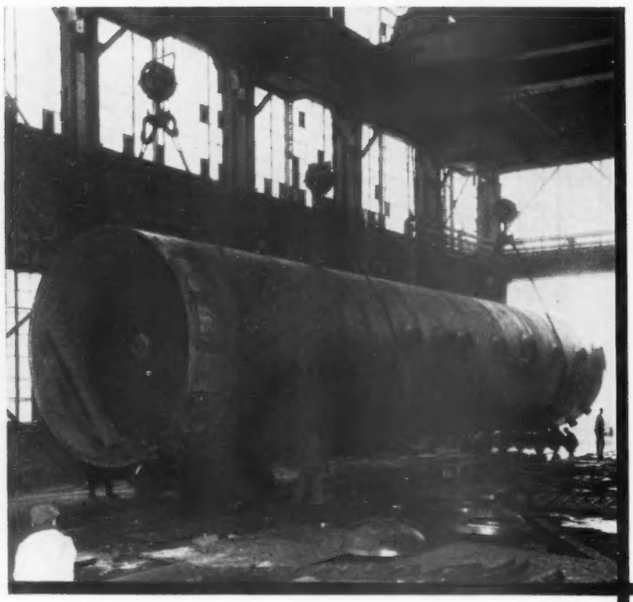


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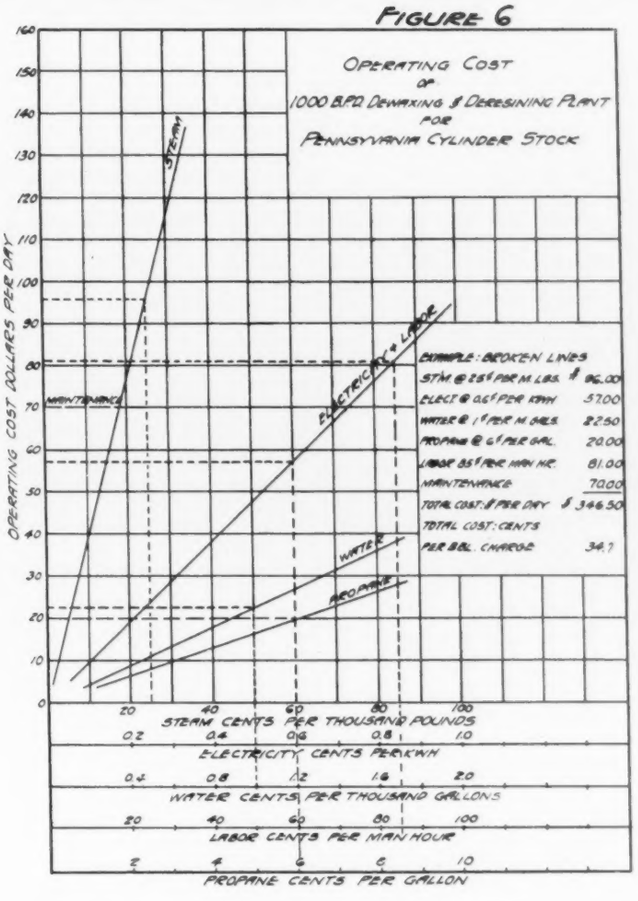
FIGURE 6


OPERATING COST OF 1000 B.P.D. DEWAXING & DERESINING PLANT FOR PENNSYLVANIA CYLINDER STOCK
OPERATING COST DOLLARS PER DAY
STEAM
ELECTRICITY & LABOR
MAINTENANCE
WATER
PROPANE
EXAMPLE: BROKEN LINES
STM @ 25¢ PER M LBS. $ 96.00
ELECT @ 0.6¢ PER K.W.H. 57.00
WATER @ 1¢ PER M GALS. 22.50
PROPANE @ 6¢ PER GAL. 20.00
LABOR 85¢ PER MAN HR. 81.00
MAINTENANCE 70.00
TOTAL COST: $ PER DAY $ 346.50
TOTAL COST: CENTS PER BBL. CHARGE 34.7
STEAM CENTS PER THOUSAND POUNDS
ELECTRICITY CENTS PER K.W.H.
WATER CENTS PER THOUSAND GALLONS
LABOR CENTS PER MAN HOUR
PROPANE CENTS PER GALLON

deresining would normally have been taken out by the decolorizing step. A deresining plant could precipitate much more of the cylinder stock without appreciable increase in cost, but when the resin fraction amounts to more than six per cent the savings in clay alone will not always pay for the decrease in finished oil.

This point is shown by the operations to produce 13 per cent of resins, where the clay consumption was only 20 per cent of the requirement when using conventional dewaxing. Where the removal of four per cent resins reduced the clay consumption by 50 per cent, the removal of the additional nine per cent reduced it only 30 per cent with a net saving of only about $0.35 per barrel and a net decrease of nearly four gallons of finished bright stock per barrel of charge. Obviously, if finished bright stock has a differential value of $0.15 per gallon, this operation must depend on production of materials other than fuel from the resins, or on the increase in neutral equivalent. On the other hand, if the differential value is only $0.06 per gallon, the operation is economically justified even if the resins are discarded as fuel, and the increase neutral equivalent is an added advantage.

Although either a propane dewaxing plant or a propane deresining plant will show a satisfactory pay-off

TABLE II

Yields Obtained With Various Stocks

(Six Months Totals)

	Cylinder Stock—165Vis. Zero Pour 125 Vis.	Zero Pour 150 Vis.	@ 210°F. +20°F. Pour 150-Vis.	Heavy Neutral Zero Pour	Light Neutral Zero Pour
Stock Charged					
Barrels	12,676	45,837	59,872	14,864	37,727
Dewaxed Oil					
Barrels	10,717	39,180	54,218	12,558	31,089
Per Cent	84.6	85.5	90.5	84.5	82.4
Dewaxed and Deresined Oil					
Barrels	8,797	36,647	51,152	.....	.....
Per Cent	69.4	80.0	85.4	....	....
Petrolatum or Wax					
Barrels	1,959	6,657	5,654	2,306	6,638
Per Cent	15.4	14.5	9.5	15.5	17.6
Resins					
Barrels	1,920	2,533	3,066	.....	.....
Per Cent	15.2	5.5	5.1	....	....

TABLE III

Operating Cost of Propane Processing

	Dewaxing	Deresining	Dewaxing and Deresining
Charge Capacity, B.P.D.	1,000	850	1,000
	Operating Cost : Dollars Per Day		
Steam @ 25c/M lbs.	$64.00	$81.50	$96.00
Electricity @ 0.6c/K.W.H.	62.00	2.50	57.00
Water @ 1c/M Gals.	20.00	14.50	22.50
Propane @ 6c/Gal.	14.00	15.50	20.00
Labor @ 85c Per Man Hr.	81.00	41.50	81.00
Maintenance @ 3%	60.00	20.00	70.00
	$301.00	$175.50	$346.50
Cost Cents Per Barrel Charge	30.1	20.6	34.7
Cost Cents Per Bbl. Cyl. Stock	30.1	17.6	34.7

period when installed separately, the combination of both processes in a single unit is even more attractive. The operations over the past 18 months show that the economies effected by installation of a combined plant to charge 1000 barrels per day result in a pay-off period of about 20 months. A comparison of the operating costs for a plant to dewax 1000 barrels per day of cylinder stock, and deresin the dewaxed oil, with corresponding costs for the separate plants, is shown in Table III. The difference in the costs is about $0.13 per barrel of cylinder stock or about $45,000 per year in favor of the combined plant, and the installation cost for the combined plant would be about $100,000 lower than for the separate plants.

Obviously, all refiners of Pennsylvania oils will not have the same costs for utilities and labor, and for this reason the accompanying chart, Figure 6, has been prepared so that each refiner can estimate, for his own conditions, the approximate operating cost when employing propane to dewax and deresin Pennsylvania cylinder stock. The example chosen on this chart is based on one particular set of unit costs but a refiner may substitute his own costs to determine an approximate total operating cost. Actual design for any given situation might change the relative proportion of various items in order to arrive at a minimum cost, so that such figures cannot be considered as final.

The economic advantages of propane processes in other refineries would not necessarily be the same as for the conditions at the Kendall Refining Co., since the relative importance of dewaxing and decolorizing costs may vary to some extent. It has been shown, however, that propane dewaxing and propane deresining will bring about a reduction in the cost of both of these operations and it can be expected that savings will be made in other refineries comparable with those which have been made by the Kendall Refining Co.

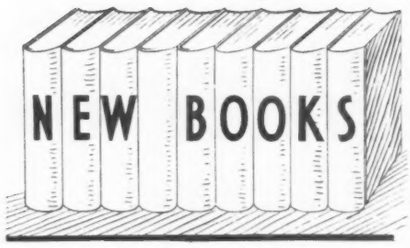
SUMMARY:

The facts presented in this paper may be summarized as follows:

(1) The status of the Pennsylvania refiner as a manufacturer and marketer of lubricating oils has been appreciably changed during the past few years by events which include: (a) Competition of improved oils produced from lower cost crudes, (b) Reduction in the average viscosity required for automotive oils with a resultant greater surplus of bright stock, and (c) Demand for lubricants of still higher quality brought about by the use of more severe engine conditions.

(2) To combat these changed conditions, it appears that the Pennsylvania refiner should make changes in his refining methods which will improve the quality of lubricants produced, increase the quantity of neutral equivalent obtained from the crude, and decrease manufacturing costs.

(3) Commercial operating results have been presented which show that the use of propane processing methods will reduce manufacturing costs, increase the amount of blended motor oils which can be made and correspondingly decrease the surplus bright stock, while at the same time giving an increase in the overall yield of lubricants and some improvement in the quality of the bright stock and serving as a means of preparing residual stocks for most efficient treatment with selective single solvents.



New Book Assembles Patents on Cracking

STUDENTS, attorneys and refining executives who have had occasion to delve into the tremendous mass of patent literature on cracking processes and cracking patent litigation will welcome with open arms and minds this publication of the first complete assembly and arrangement of cracking patents for the layman and technologist.

The volume, which is by David McKnight, Jr., a chemical engineer and secretary of the Bureau of Industrial Chemistry, University of Texas, Austin, contains 11 chapters and 627 pages, which include discussions and summaries of patents dealing with the Burton, Dubbs, Cross, Holmes-Manley, Tube and Tank and other "liquid phase" processes, one chapter devoted to "vapor phase" processes, and a special chapter on Hydrogenation and Polymerization.

The work of this volume is really grouped around Chapter I, which discusses in some detail the "Cracking Patent Situation", as the present confused and involved condition in the Patent Office and cracking patents is termed. The author takes cognizance of the "protests" against the use, or alleged mis-use of the patent law and the protection afforded the patentee on inventions, by development and licensing companies. He points out that these companies have been accused of using the patent system to obtain perpetual monopolies on the art of cracking "Against such accusations," the introductory remarks state, "the patent holding companies offer many weighty arguments." One of the weightiest of these appears to be claim that small refiners, lacking organization and staff to carry on research for themselves, would have been unable to stay in the running, if patent holders had refused to license their processes.

The author finds some fault with the methods of extending the time of a patent application before issuance, pointing out that applications have been pending in some instances as long as 20 years; one cracking patent application was filed in 1918 and the patent issued in 1936.

The important patents around which the several well known commercial processes are built are summarized in separate chapters. The main claims of the patents are presented, with occasional patent drawings to illustrate the fundamental principles claimed for the process referred to. In some cases the written discussions of phases of process and equipment may seem inadequate, as for instance the presentation of fundamentals of furnaces such as de Florez and Equiflux; it must be kept in mind that this is a brief review of a very involved subject, and not an exhaustive examination of innumerable details, which would require many volumes.

The U. S. Patent Office has adopted a "rather liberal policy", the author believes, in issuing patents, and it does not guarantee that issuance of a patent is prima facie a determination of its validity. Validity must be determined in the courts, which saddles onto the individual or company the frequently immense cost of litigation, extending over a period of years, it is pointed out.

Our recognition of the good points of our patent system and its great influence on our industrial development has caused us to resist any changes in methods for the examination of applications or in the issuance of patents, the author points out. The two main defects in the present patent issuing practice are the inability of the patent office to properly examine an application, enough to more nearly insure the patent's validity if and when issued, and the long dragging-out of the period of the application.

In discussing the first, the author says that a larger force in the Patent Office would correct that only if the examiners have broader powers, and were in closer touch with industrial practice. For the second defect he refers to some European, especially German, practices and suggests the possibility of limiting the period of application to three years and extending the length of time from date of application to expiration of patents to 20 years, including the time the application is in the patent office.

While no effort has been made to check the tables of patents to determine if every possible patent is included, this work appears very complete for the use of practically anyone in the industry interested in this field. In addition to the tables of patents issued, the patentees and assignees, and brief summaries of fundamental claims, an exhaustive index of patentees and assignees is included in the work. A tabular summary of cracking patent litigation is included, which although not every reference will be found entirely up-to-date—will prove invaluable also to those whose work necessitates a close investigation of these matters.

The volume is obtainable from the University of Texas, Austin, as Bulletin No. 3831, price $3.

A.S.T.M. PROCEEDINGS FOR 1937

The 1937 Proceedings of the American Society for Testing Materials has just been published in two parts. Part I comprises 1365 pages of committee reports (with appended papers) and new revised A.S.T.M. tentative standards. Part II gives all technical papers for the year including the Marburg lecture on plastics. It contains 707 pages.

Reports of 45 committees outline important standardization and research work on many materials including petroleum products and lubricants. This part also contains some 118 specifications and tests prepared for the first time in 1937 or revised. The presidential address by Dr. A. C. Fieldner on "Fuels of Today and Tomorrow" is also included in Part I.

An important feature of Part II is the extensive discussion of the 47 technical papers. Papers pertaining to petroleum are confined mainly to problems concerning asphalt properties and uses. A Laboratory Channel Test for Gear Oils by J. P. Stewart is included. Articles on asphalt cover design for underwater construction, compression tests of paving mixtures, homogenity of West Texas asphalts, indentation and compression shear tests for asphalt plank, and other subjects.

Two articles are of interest in connection with water-conditioning problems. One deals with the use of the polarizing microscope and the other with hardness determination by direct titration. New equipment for creep tests of metals at elevated temperatures is described by P. G. McVetty, Westinghouse engineer, and there is included a comparison of methods used in interpreting creep test data by Joseph Marin, Rutgers university professor.

Part I and II can be purchased at $5.50 each in stiff paper cover; $6 in cloth; and $7 in half-leather bindings at A.S.T.M. Headquarters, 260 S. Broad St., Philadelphia.

Photographic Study Issued

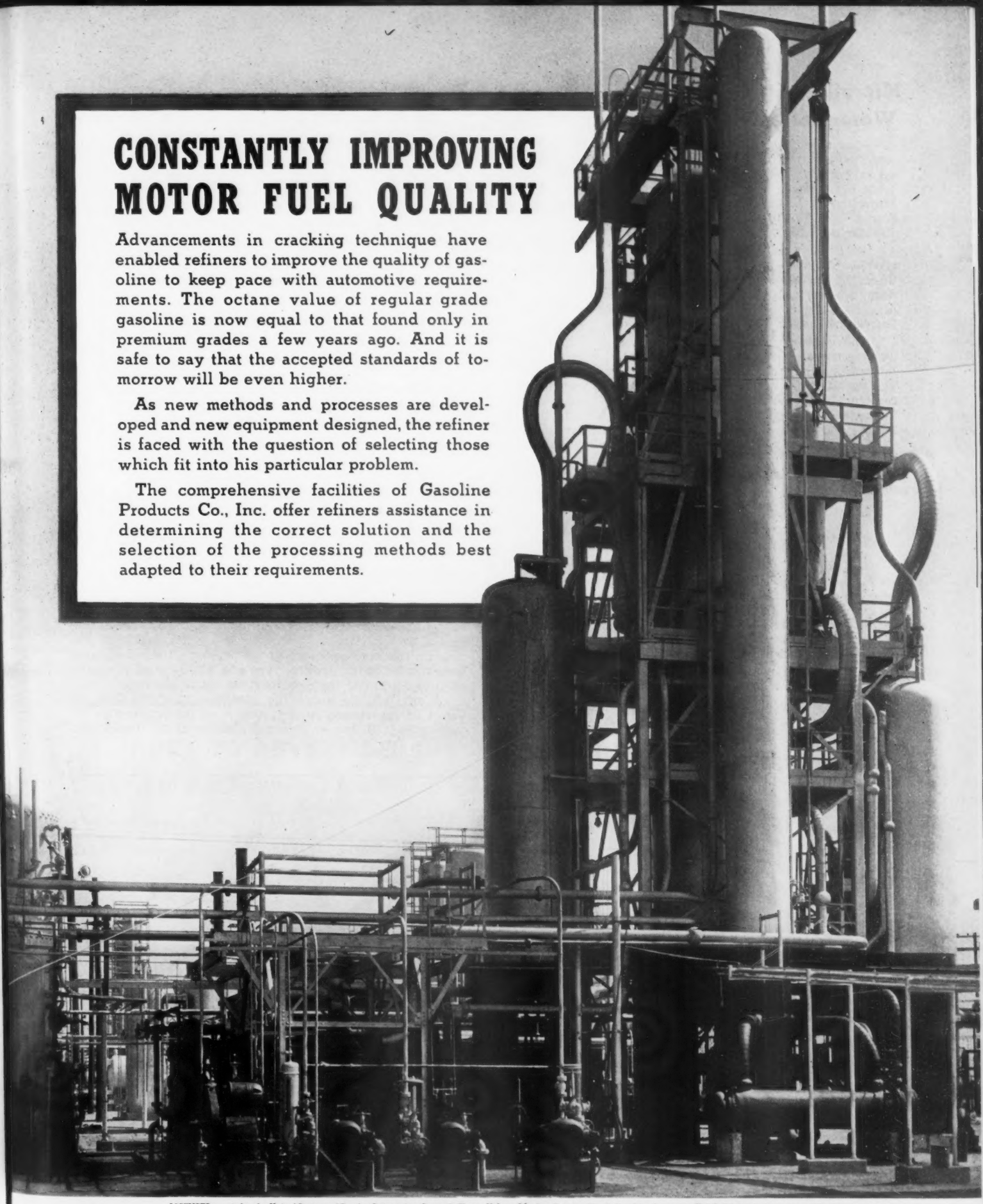
A detailed petrographic study of the complete diamond core of a well in the Kane portion of the Bradford field is announced by Pennsylvania State College. This paper brings out a mass of original information and discusses some of the little known problems of the relation of sand composition and petroleum production, according to Allen W. Waldo, the author. The paper (Bulletin 24) is available in paper binding at 50 cents. Orders should be addressed to the Director, Mineral Industries Experiment Station, State College, Pa.

CONSTANTLY IMPROVING MOTOR FUEL QUALITY

Advancements in cracking technique have enabled refiners to improve the quality of gasoline to keep pace with automotive requirements. The octane value of regular grade gasoline is now equal to that found only in premium grades a few years ago. And it is safe to say that the accepted standards of tomorrow will be even higher.

As new methods and processes are developed and new equipment designed, the refiner is faced with the question of selecting those which fit into his particular problem.

The comprehensive facilities of Gasoline Products Co., Inc. offer refiners assistance in determining the correct solution and the selection of the processing methods best adapted to their requirements.



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Microflora in Oil Tank Water-Bottoms Corrosive

Recent studies to determine whether conditions in the water-bottoms of oil storage tanks would enable a specific oil microflora to establish itself and to ascertain if and to what extent such a microflora would deleteriously affect either the oil or the tank structure have been made by the British Government Department of Scientific and Industrial Research.

So far a preliminary investigation has shown that microflora can and does establish itself and that it varies little in the various samples taken from different tanks. The flora consists essentially of non-spore forming rods, and of vibrios, types which develop only in part on the usual laboratory media.

One organism met with in every sample of oil-tank water possesses powerful reducing properties towards sulfates which are said to be invariably present in tank waters. The result is formation of hydrogen sulfide, which either combines with metallic substances suspended or dissolved in the water, or penetrates through the water into the oil, thereby contaminating it with sulfur in a corrosive form.

Observations so far indicate that further investigations in this field would be of interest both from a theoretical and a practical point of view. The type of organism just described is but one on which the work so far has been restricted.

Creep Data

CLEVELAND, June 4.—A volume on "Creep Data" has been made possible by several years' work and the co-operation of numerous technologists and organizations and is now being published jointly by the American Society for Testing Materials and the American Society of Mechanical Engineers, through the joint committee on effect of temperature on the properties of metals.

The society recommends the book, among others, to consumers and producers of petroleum refining equipment. The interpreted results of over 300 creep tests will soon be available in convenient form at $12. The volume gives for the first time in one place and in similar form not only much data which have been issued previously, it is said, but also a great deal of unpublished data.

All told there will be over 420 charts of test data and some 270 graphs and 73 tables. The committee is considering the desirability of issuing the material in a loose-leaf binder in preference to a bound book, with data printed on one side of the sheet. There will be 900 pages, 8½ by 11-inch page size. If published on loose leaves the price would be increased about $2. Orders should be addressed to the society, 260 S. Broad St., Philadelphia.

Advocates Central Depository For Scientific Papers

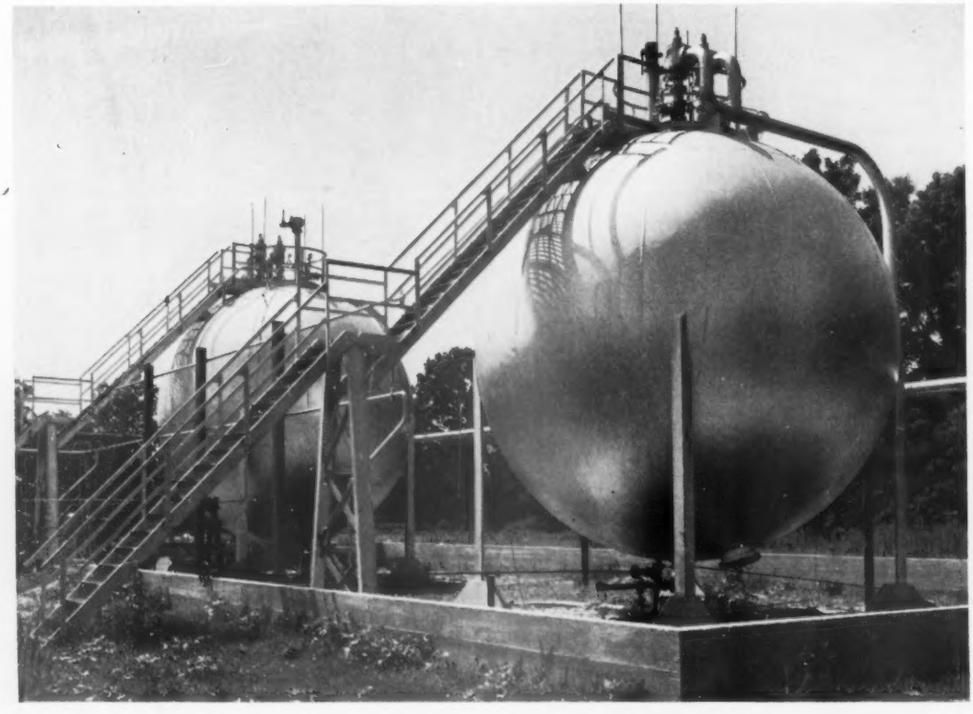
The need for a central depository for scientific papers, released at the rate of 5000 or more per year by 500 societies, was emphasized by Sarah B. Pruden, librarian for National Oil Products Co., Harrison, N. J., at the recent thirtieth annual conference of the Special Libraries Association. A committee of this group has made a preliminary survey of the requirements of individual libraries in the U. S. and Canada.

Replies to the survey indicate that research libraries will welcome a central depository and will utilize papers that are placed there, it was stated. A more extensive survey is planned. During the coming year the committee will confer with representatives of national societies and librarians, wherever depositories are being formed and make known the need for a national depository.

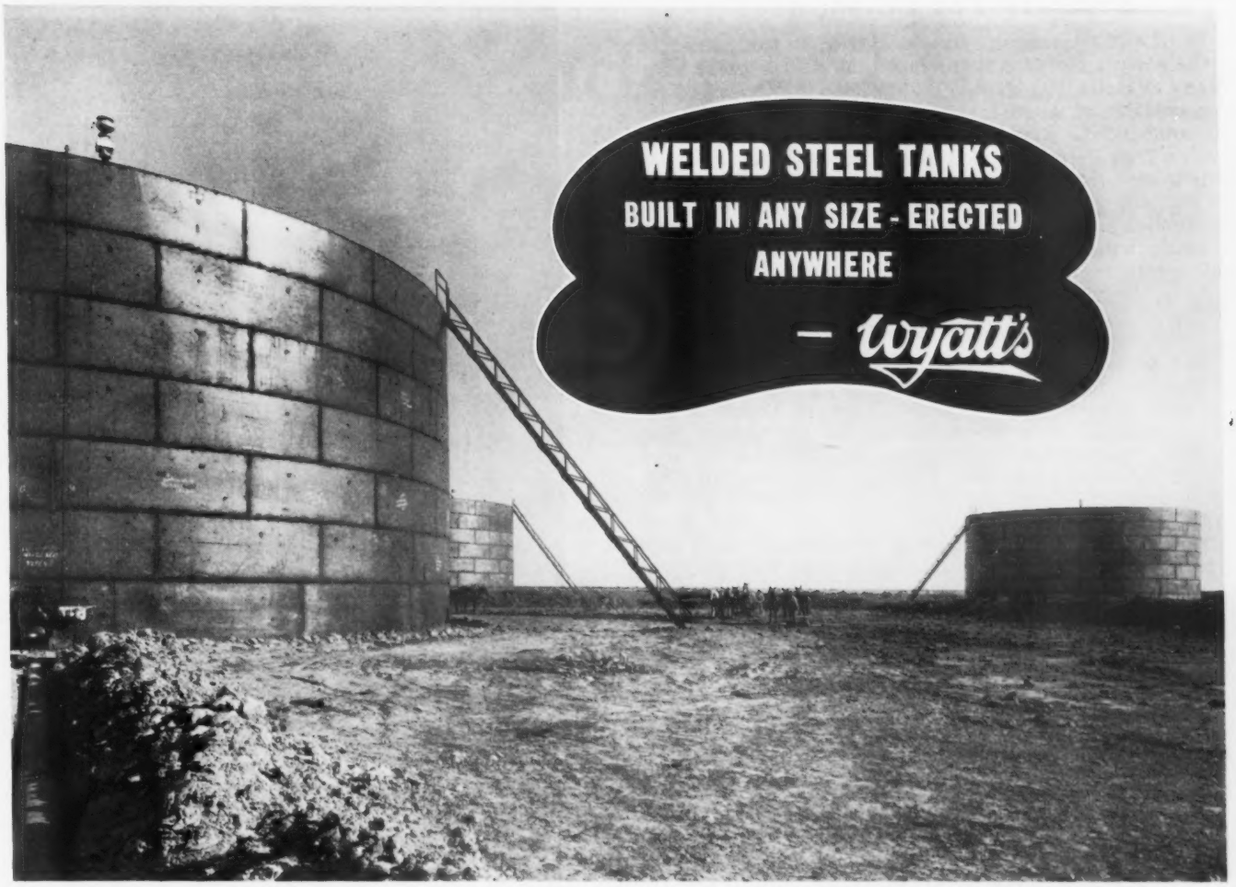
Prepare Pure Hydrocarbons

Preparation of "several dozen" pure hydrocarbons is to be undertaken soon by the Ohio State University Research Foundation, it is announced by the American Petroleum Institute, sponsors of the project. These hydrocarbons will be of the gasoline type and will be used in engine tests to determine their combustion characteristics.

Work will be under the direction of Prof. Cecil E. Boord of the chemistry department of the university, according to H. S. Jacoby, research director of the foundation.



Two Hortonspheres used at a southern refinery to store ethyl chloride under pressure. Ethyl chloride, used as a solvent and for other purposes, boils at about 54.5° F. These spheres are each 23 feet diameter and with 1135 barrels each. They are welded, and designed to operate at 75 pounds per square inch



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Refinery For Palestine

LONDON—Arrangements are said to be well advanced for the early start of construction of a 40,000-barrel daily refinery at Haifa, Palestine, by Consolidated Refineries, Ltd., representative of Anglo-Iranian Oil Co. and Shell interests, it is announced. The plant is often incorrectly referred to as an Iraq Petroleum Co. enterprise, it is said.

It is also said to be premature, to say the least, to suggest that the plant will possibly treat oil "from the newly discovered deposits near the Dead Sea." Agreements are being made with the government respecting refinery and pipeline construction.

INSTRUMENTATION CONTEST

The best written account of an unusual application of a standard instrument or control device will win a first prize of $200 in a contest sponsored by the Scientific Apparatus Makers Association, Industrial Instrument Section. The report must tell briefly what conditions or need impelled the application also. Twelve prizes, totaling $500, will be awarded.

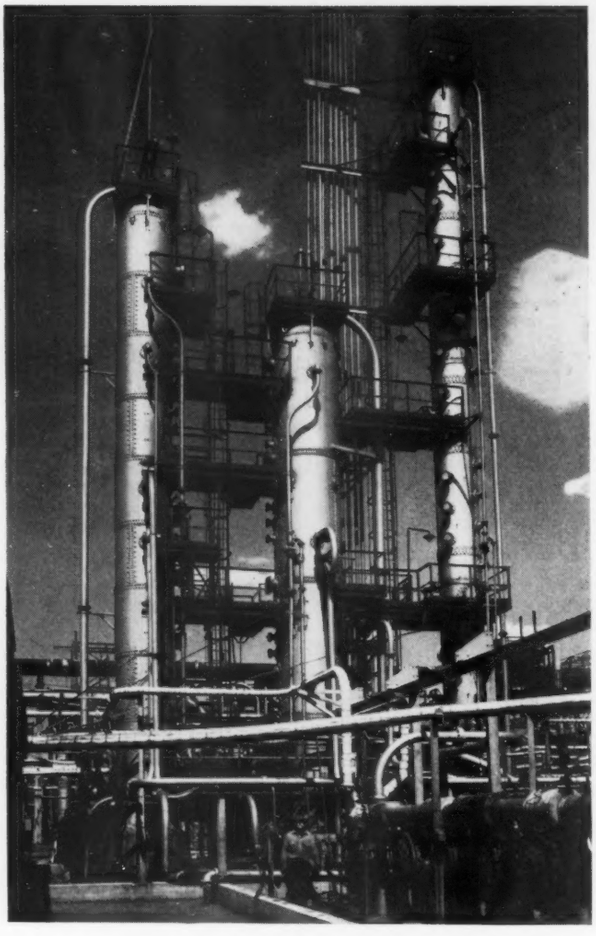
Among the judges of the contest will be R. J. S. Pigott, head of the engineering department, Gulf Research & Development Co. Chairman of the jury of award is Lyman J. Briggs, director of the National Bureau of Standards. The contest closes Nov. 15. Copies of the contest rules and official entry form can be obtained from Scientific Apparatus Makers of America, 20 N. Wacker Dr., Chicago.

Elected Vice President Of Continental Oil

J. G. Dyer, until recently manager of Continental Oil Co.'s pipeline department and of its production and drilling operations east of the Rockies, was elected a vice president.

Born near New Orleans, Dyer was almost lost to the oil industry when he was offered contracts to play professional baseball. His long experience includes log scaling, accountancy, work in the refinery, oil field work from roustabout to field superintendent and vice president of Continental's Pipe Line Co. He spent several years in the Wyoming and Rocky Mountain production areas.

Dyer owns several patents pertaining primarily to drilling equipment, methods for drilling heaving shale and other subjects.



A trim and efficient vapor recover plant in Standard of New Jersey's Bayway refinery

Oil Exports From Iraq Increase

WASHINGTON—Exports of crude petroleum from Iraq have registered a progressive increase during recent years, according to a report from Vice Consul Walworth Barbour, Baghdad, to the commerce department.

Three oil companies are at present operating in Iraq as follows:

The Iraq Petroleum Co. operating in the Baba Gugur (Kirkuk oilfields) on the west bank of the Tigris River, is producing oil in commercial quantities and is shipping its products to the Mediterranean seaboard through a pipeline.

The Khanaqin Oil Co., Ltd., a subsidiary of the Anglo-Iranian Oil Co., Ltd., operating near Khanaqin, is producing oil in commercial quantities and is marketing its products in Iraq through the Rafidain Oil Co., Ltd.

The British Oil Development Co., Ltd., operating on the west bank of the Tigris near Mosul, is producing small quantities of oil but is not shipping or marketing it at present.

Crude production during the first six months of 1938 by the above-mentioned companies were as follows: Iraq Petroleum Co., 15,598,629 barrels; Khanaqin Oil Co., 423,191 barrels, and British Oil Development Co., 115,645 barrels.

Quantity of crude exported by the Iraq Petroleum Co. to Haifa and Tripoli by the pipeline during recent years was as follows:

	To Tripoli Barrels	To Haifa Barrels	Total Barrels
First half of 1938	7,875,902	7,856,021	15,731,923
1937	15,501,932	15,279,475	30,781,407
1936	14,965,111	14,588,269	29,553,380
1935	12,617,986	14,138,267	26,756,253

Grease Standardization By Consistency Undertaken

By M. G. Van Voorhis
N. P. N. Staff Writer

Highlights from the proceedings of the annual convention of the National Lubricating Grease Institute were:

Plans approved to classify all lubricating greases by consistency to avoid confusion to the consumer and to the oil company marketing these products.

Purchasers of greases should not draw their specifications so closely that the experience of the lubricant manufacturer is rejected, it was brought out. Specifications should govern functional properties only.

Sales of grease and oil need not be trailers to gasoline sales but can be made to appeal to the consumer through proper packaging and the use of simple sales points, bringing out color, odor, cleanliness and so on.

The oil companies should educate the engineering departments of the automobile manufacturing companies as to the nature of their greases, and how they must perform in automobile lubrication points, in order to secure better designing from the point of view of proper and convenient lubrication.

Prominent members of the National Lubricating Grease Institute are M. B. Chittick (left), Pure Oil Co., and retiring President G. W. Miller (right), Master Lubricants, Inc. Chittick is directing a fine piece of work as chairman of the institute's technical committee on standardization of greases. Miller will still take an active part in institute affairs as its secretary during the coming year

Plans to complete the tentative classification of lubricating greases of all types into six grades according to their consistency were announced by the National Lubricating Grease Institute, at the close of its sixth annual meeting in Chicago Oct. 3 and 4.

The proposed classification will not be a distinguishing mark for the quality of greases, but it is felt it will eliminate much of the confusion that has existed for the consumer and the marketer of these products, through aligning all types of greases by grades according to their thickness or softness, their most easily distinguishable characteristic.

The consistency classification will be upon the basis of penetration by the tentative standard testing method of the American Society for Testing Materials.

This grading will eventually mean for greases what S. A. E. numbers have meant for motor oils. Consistency, of course, no more completely defines the value of a grease as a lubricant than S. A. E. numbers do for lubricating oil. However, being one of the first properties in which consumers are concerned, an orderly alignment of greases in this respect will avoid confusion that has existed heretofore for the consumer and manufacturer alike. As such, it is not a specification or quality arrangement.

The numbering system has been used in the past for cup greases but is now intended to apply to all greases of any base and for any purpose. The present classification, as prepared by the Technical committee of the grease institute, under the direction of Chairman M. B. Chittick, of Chicago, Pure Oil Co. is based upon the A. S. T. M. worked penetration test giving results in terms of depths of penetration measured in tenths of a millimeter.

In making the test, a double-pitch cone of standard weight and dimensions is supported above a grease sample maintained at a standard temperature and allowed to drop into the product. A dial scale on the instrument measures the depth of penetration of the cone into the grease sample. The ranges of penetration proposed by the committee are as follows:

No. 0	355-385
No. 1	310-340
No. 2	265-295
No. 3	220-250
No. 4	175-205
No. 5	130-160
No. 6	85-115

The classification gives a gap between each grade so that there is no possibility of over-lapping of grades. From a marketing standpoint this seems highly desirable, Chittick stated, since it will eliminate the substitution of one grade for another. This substitution has been a source of misunderstanding and confusion, he said.

Completion of the formulation will mean a final agreement upon the ranges of penetration given above or their modification. When and if adopted by the institute, the basis will be forwarded to other technical groups such as the Society of Automotive Engineers, the American Society for Testing Materials, and American Gear Manufacturers Association, for study and adoption.

Wide coverage of the present state of tests for evaluation of lubricating grease in service was presented to the institute's convention by Dr. W. A. Gruse of Pittsburgh, of Mellon Institute.

The present knowledge of grease properties is so far from complete, according to Dr. Gruse, that the factors which influence them can be approached only by speculation concerning their structure and mechanical stability. At present, he said, the best we can do is to set up theories for comparison with experimental work on consistency and stability, in the hope that ultimately a connection can be established.

While the consistency of a grease is commonly estimated by some type of penetrometer, Dr. Gruse stated that at the present time no method for studying flow and consistency properties of greases is in a satisfactory state of development. The extent to which the consistency and mechanical stabil-

Something would be noticeably missing from lubricating grease institute conventions without the presence of Dr. W. S. James, Studebaker's chief engineer; Oscar Maag, Timken Roller Bearing Co., and Raymond Haskell, The Texas Co., (left to right). All were contributors to the program either by prepared papers or discussion

ity of a grease are influenced by shearing, of the kind and amount that it would receive in service, while known qualitatively, is deserving of careful quantitative study and makes up one of the next big problems in the field, he said. Several methods of consistency measurement were discussed.

Dr. Gruse also drew upon the work of several who had probed the structure of greases and pictured a "lime soap grease as made up of a soap-oil gel carrying as much firmly adsorbed oil as it can, swollen by still other oil, which is held in the gel structure with varying but lower degrees of firmness, the whole carrying (depending on concentration) a mass of soap crystals, which will be large or small, fibrous or clustered, as determined by composition and manufacture."

IT is desirable to provide in this mechanism for water and glycerol also, he said, although there are exceptions where one or both may be missing. Some views on the structural arrangement were discussed.

Separation of oil from grease is of considerable practical importance, Dr. Gruse pointed out, and a suitable test is desirable. The method proposed by Herschel in 1933 involving a grease press in which a weighted plunger resting on a grease sample squeezes oil from the grease into blotting paper and filter paper discs was considered an improvement over other methods in common use.

Eventual breakdown of a grease is as inevitable as the wearing out of any mechanical equipment, it was pointed out in relation to chemical and oxidation stability, and should be taken into account in service even in greases to which oxidation inhibitors have been added.

"The requirement that a grease shall remain unchanged and fit for service for several years and over temperatures ranging from —40 to +400 F. with exposure to air, to humidity or actual moisture, and to the well-known oxidation accelerating effects of metals such as copper or bronze, seems a little unreasonable to a chemist," Dr. Gruse said. "The petroleum hydrocarbons present are quite stable, but they do change, while the fatty oils and fatty acids which make up the soaps, are several steps lower on the scale of stability."

Chemical stability may be influenced not only by substances which a grease contacts but also deleterious constituents. The most important outside contact substances are air and water, it was pointed out. The assumption of complete stability arose when milder conditions were the rule but it is not correct in these days of high loads and high temperatures. While various hydrocarbons and their mixtures differ by hundreds and even thousands of per cent in the speed, extent, and direction of oxidation, with resulting great inequalities in value and serviceability, the fact remains that eventually they will oxidize. A realization by engineers of this fact would save much irritation and perhaps avoid some failures, said Dr. Gruse.

Oxidation tests are extremely important in evaluation of greases for special applications such as sealed ball bearings, ball bearings packed for storage or anti-friction bearings operated at relatively high temperatures. Although practical results are being obtained by the well-known Wright-Lutz method, Dr. Gruse cautioned that neither this test nor any other common method evaluates undesirable changes in consistency which accompany oxidation. No single test is available for evaluating all desirable properties, and in general, each specific desirable property must be investigated independently before semi-service or actual service tests are made.

Since greases are by no means standardized yet, Dr. Gruse intimated that purchasers of greases should not specify so closely that they thus reject manufacturers' experience. Purchasers are increasingly narrowing specifications until it is quite usual to specify the kind and amount of soap, the base, viscosity and amount of oil, the color, odor and appearance, the consistency, the proportion of free acid and moisture. In a number of instances this has led to troubles which would have been avoided by specifications governing functional properties only.

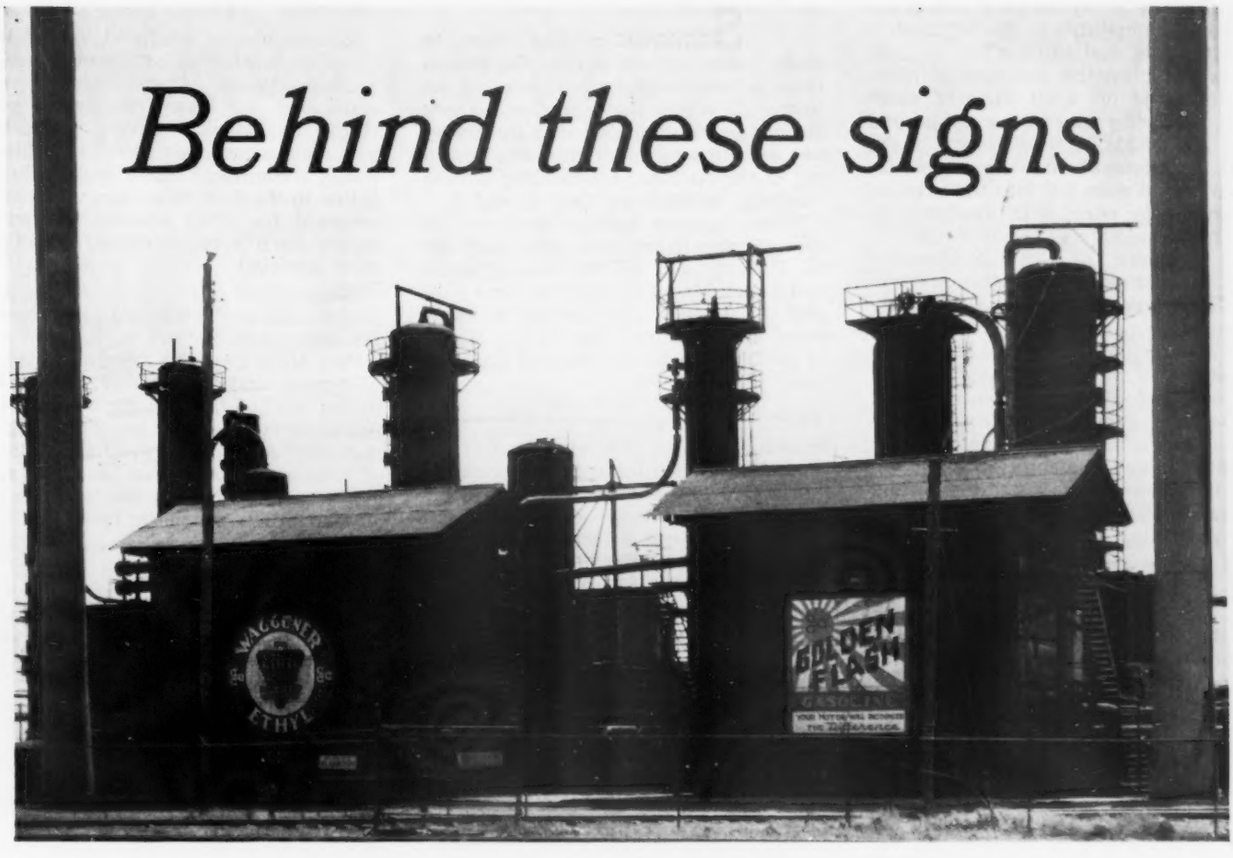
Some rapid methods for determining oil in lubricating greases were described before the grease institute in a paper by C. J. Boner, L. W. Yagle and G. A. Williams of the Battenfeld Grease & Oil Co., Kansas City, read by J. R. Battenfeld. Results obtained by the authors in one-fourth the time were in fairly close agreement with the standard A.S.T.M. method and were said to avoid some discrepancies often resulting when the standard method was used. The method has been applied to calcium, lime and aluminum base greases but not to greases containing rosin or additives for extreme pressure service.

M. J. Helmes, United American Bosch Corp., concluded the first session of the convention with an interesting discussion of force feeds and automatic equipment for applying greases. Helmes stressed the uncertainty of grease cups and guns in assuring a consistent rate of flow and showed how mechanical feed systems are flexible enough to meet the most exacting needs for varying rates and pressures of application.

AN attack on present merchandising methods of lubricating greases was made by Frank W. Lovejoy, Socony-Vacuum Oil Co., from the standpoint of the "man on the street". In a dramatic way he told how any product must be surrounded with simple qualifications, colors, phrases, cleanliness, odors, packaging, shininess, and the like, which have been shown to appeal to the average consumer, rather than the hard-to-understand phases of lubrication technology and questionable nomenclature. Grease and oil must not be trailers to gasoline if real sales are to be made, he said, but must be given individual attention and study.

The development of application equipment in the service station for automotive grease was described by Charles A. Fine, Alemite Division of Stewart Warner Corp., who urged the use of modern attractive equipment as a factor in appealing to consumer desire and preference. He also called attention to reduction in effort required by complete and efficient equipment and called attention to the ease of keeping the smooth-surfaced cabinets clean and shining.

O. L. Maag, Timken Roller Bearing Co., had words of praise for the general satisfactory service of present day greases but said he felt that a step forward would be to have standards of penetration, unworked and worked, and also control even changes of these properties with heating and aging. There is also need for better understanding of



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It pays to tell your customers it IS Dubbscracked gasoline

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Chicago, Illinois

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what constitutes a long and short fibre grease, a method of measuring this property, and better control in production. Penetration readings, as taken now, apparently do not always tell whether a grease will leak by closures, he said.

If the petroleum industry would not try to sell lubricants to the automobile manufacturer and automotive engineer but would keep the automobile industry informed on what kind of lubricants are being sold to the public and what the trends of development in the available lubricants are, the chassis designer would soon fall into the habit of designing car parts with available lubricants in mind, said Dr. W. S. James, chief engineer of The Studebaker Corp. in the final session of the convention. Designers are kept constantly informed by parts suppliers as to possible modifications in design due to improvement in materials, manufacturing methods and other pertinent factors. In the case of lubricants he said little or no information was given on the limitations and capabilities of available lubricants, to say nothing of the extent of their availability and their possible modification.

Dr. James commended the industry for a remarkable job in distributing lubricants through filling stations and informing station men in their use. On the other hand he expressed the opinion that better than 95 per cent of the men on the drafting boards of the automotive industry do not know as much about what greases are actually put into the parts they work out, what these greases look like and feel like and how they may behave in the parts they are interested in, as most of the service station and garage men whom the petroleum industry have educated in chassis lubrication. He added that it is just the simplest kind of education in simple language that these men need, in terms that any station man can understand.

A machine for measuring the more important characteristics of greases in anti-friction bearing service—starting and running torque, bearing temperature, leakage, and adherence of grease to the bearing—was described by Gus Kaufman, The Texas Co., and the results of tests made with the machine were discussed. Among his findings were the fact that the tendency of a grease to become softer on working down bears no relationship to leakage tendency. His data showed also that "the assumption that milling a grease imparts to it the final worked consistency to be expected after use in anti-friction bearings and that it therefore gives superior performance to an unmilled grease is not borne out."

Hypoid gear lubrication experience during the 14 years that Packard Motor Car Co. has used this type of gear was traced by W. R. Griswold of that company. He said one of principal difficulties in early use of this gear was convincing the car owners that only the lubricant they recommended would be satisfactory. He compared the fundamentals of different gear types to show the need for extreme pressure lubrication and showed also how load deflection in poorly designed gear mountings would affect the wearing qualities of the gears.

Excellent lubricants for these gears are generally available now, Griswold said, but, looking into the future, he saw great possibilities in still better lubricants affecting car design. The present axle is now in the way of rear seat springs, he said, and the only thing stopping smaller axles is the assurance of the right lubricant. He stressed the point that the need for adequate universal distribution of high quality lubricants is the only deterrent to advance in the design of automobiles.

Substitution of extreme pressure lubricant, applied by an automatic force feed system, for cheap black oil in a recent installation at the Gary works of the Carnegie-Illinois Steel Corp. resulted in one pound of grease being used where 30 gallons of oil had formerly been required, Frank L. Gray, company lubrication engineer, told the lubricating grease institute convention in discussing steel mill lubrication problems. He said this installation was saving the company $68,000 per year in material and lost time. On bearings, extreme pressure lubricants are answering every need and one lubricant can be placed in a mill for every purpose of load, speed, low and reasonable mill temperatures. Extreme pressure lubricants have enabled a big step forward in the steel mill, he said.

Gray's experience is that "the grease manufacturer has kept abreast of the times and has been a prime mover in encouraging the development of equipment to utilize his products efficiently, economically, and intelligently." He said, "we must depend upon the integrity of the grease manufacturer. While his formulas are his secrets his co-operation has been of mutual benefit and an absolute necessity in working out steel mill problems."

Less Frequent Wheel Bearing Lubrication Seen as Trend

SERVICE station men, in many cases, do not realize the importance of automobile wheel bearing adjustment when they lubricate these bearings. This opinion was shared by two speakers at the sixth annual meeting of the National Lubricating Grease Institute in Chicago Oct. 3 and 4.

Wheel bearing lubrication from the service standpoint was discussed by W. P. Eddy, Jr., of the Yellow Truck and Coach Mfg. Co., and the same subject from the manufacturer's viewpoint was discussed by O. L. Maag, of the Timken Roller Bearing Co.

Eddy spoke of the trend toward less frequent lubrication of wheel bearings, particularly if present designs are continued. He stated that in the near future he believed makers of passenger cars and commercial vehicles would recommend wheel bearing lubrication in the field only when wheels are removed for other reasons. (Pontiac makes such a recommendation on its 1939 models.)

Eddy points out that, as far as passenger cars are concerned, the reasons for this trend appear to be:

"(1) More frequent lubrication is unnecessary and (2) the car manufacturers realize that wheel bearing adjustment is of great importance, and they believe that improper adjustment of bearings by service station and garage attendants is more liable to be obtained than proper adjustment."

"The second of these reasons is significant," Eddy pointed out, "in that it indicates the lack of faith of the car manufacturers in the training of and care exercised by the average mechanic who lubricates automobiles. Some of the car manufacturers are frank to admit that the trouble is just as serious in the garages of their own agencies as in the service stations of the lubricant manufacturers."

There have been a few cases, according to Eddy, of operators who reported excellent results with extreme pressure greases in wheel bearings, but he added that performance data on this type of lubricant in actual service is meager.

Eddy stated that there seemed to be an unquestioned trend toward the use of less lubricant in wheel bearings.

"Our experience indicates that, if the bearings themselves are adequately and properly lubricated with a suitable grease, excess grease in the wheel hub is of no value and may actually be a detriment," Eddy commented, adding that the fundamental cause of troubles with wheel bearings seems to be that the designs in use today require the use of heavy greases.

"If seals and hub designs which would permit using fairly light oils as lubricants could be devised," Eddy said, "our troubles would be over or at least greatly diminished. The oils could circulate and keep the bearings cool and clean."

While he stated that it seemed improbable now that this ideal condition could be attained, he believed it may be possible to approach it to the extent that fluid or semi-fluid grease could be retained in the wheel hubs.

If this were brought about, he believed the use of reservoirs containing appreciable amounts of lubricant would probably result, and the practice of renewal of lubricants at fre-

IT'S A MATTER OF RECORD THAT
CHAMPIONS PERFORM BETTER

WESTERN UNION
DETROIT MICHIGAN
OCTOBER 2, 1938
CHAMPION SPARK PLUG COMPANY
TOLEDO OHIO
WON THE 150 MILE MIDGET CLASSIC BREAKING MY LAST YEARS RECORD FOR THE 300 LAPS STOP AS USUAL MY CHAMPIONS FUNCTIONED PERFECTLY FOR ENTIRE DISTANCE
RONNEY HOUSEHOLDER
WESTERN UNION
CHATTANOOGA TENN
SEPTEMBER 20, 1938
CHAMPION SPARK PLUG COMPANY
TOLEDO OHIO
RETAINED CLASS A AND B NATIONAL CHAMPIONSHIP DIVISION ONE STOP ESTABLISHED NEW B AMATEUR RECORD OF FIFTY THREE POINT SIX O TWO MILES PER HOUR AND NEW AMATEUR C RECORD OF FIFTY SEVEN POINT EIGHT ONE O MILES PER HOUR STOP MANY THANKS TO CHAMPION SPARK PLUGS
GAR WOOD JR.
WESTERN UNION
JUL 4, 1938
TORQUAY
EARL TWINING
CHAMPION SPARK PLUGS AGAIN PROVED THEIR SUPERIORITY IN EMANCIPATOR SEVEN WINNING DUKE OF YORK TROPHY
MORTIMER AUERBACH
WESTERN UNION
CHAMPION SPARK PLUG CO
TOLEDO OHIO
SYRACUSE, N Y
SEPT 10, 1938
CHAMPION SPARK PLUGS PERFORMED PERFECTLY HELPING ME WIN 100 MILE AAA CHAMPIONSHIP RACE AT SYRACUSE TODAY
JIMMY SNYDER
WESTERN UNION
NEW YORK N Y
DECEMBER 16, 1937
CHAMPION SPARK PLUG COMPANY
TOLEDO OHIO
CHAMPION SPARK PLUGS UNDOUBTEDLY WERE A REAL FACTOR IN AIDING ME TO WIN MY EASTERN AND NATIONAL CHAMPIONSHIPS IN SETTING SOME NEW WORLDS RECORDS AND IN COMPILING THE GREATEST NUMBER OF POINTS SCORED BY ANY ONE DRIVER IN ONE SEASON STOP LIKE A GREAT MANY OTHERS I CAN SAY CHAMPIONS HELPED MAKE A CHAMPION OF ME
DOUGLAS FONDA
WESTERN UNION
MAY 30, 1938
46
INDIANAPOLIS IND
THANKS TO THE PERFECT PERFORMANCE OF CHAMPION SPARK PLUGS IN MY BURD PISTON RING SPECIAL I WON FIRST PLACE IN THE FIVE HUNDRED MILE RACE HERE TODAY AT THE RECORD BREAKING SPEED OF 117 20 MILES PER HOUR STOP YOU CERTAINLY CAN DEPEND ON CHAMPIONS
FLOYD ROBERTS

The fact that Champions make every engine a better performing engine is testified to by a constant stream of voluntary and enthusiastic telegrams from victorious owners and drivers of racing cars, boats, midgets, motorcycles and airplanes. This concrete evidence proves, as nothing else can, that the vast sums spent by Champion to maintain research, engineering and manufacturing leadership is of inestimable value to us, to our trade, and to the ultimate consumer.

For greatest profits, turnover and consumer satisfaction, stock and push the spark plugs champions use — Champions.

CHECK AND CLEAN SPARK PLUGS WHEN YOU CHANGE OIL

W. R. Griswold (center), Packard Motor Car Co., talks it over with Sidney Bevin (left), Fiske Bros. Refining Co., and Oscar Maag (right), Timken Roller Bearing Co. Griswold discussed the development of hypoid lubrication at the grease institute convention

quent intervals, which would be possible without removing hubs or re-adjusting bearings, would perhaps be adopted.

Eddy pointed out that, if this development came about, the lubricant would be used as are lubricants in other units—not only as a lubricant, but as a cooling medium and a flushing agent as well,—and that wheel bearing lubricants would be used in much larger quantities than at present.

Eddy explained that his company had obtained reports by direct personal contact with 60 operators of motor coaches and buses, covering lubrication of wheel bearings and the troubles experienced.

OF the 60 operators, he said that only 11 had experienced trouble worth mentioning, which would indicate that the great majority of fleet operators recognize the importance of proper wheel bearing lubrication and adjustment.

The 11 operators who reported wheel bearing trouble, according to Eddy, classified their difficulties as follows: Grease leaks, seven; grease too stiff, two; short bearing life, two.

In his discussion of wheel bearing lubrication from the manufacturer's standpoint, Maag pointed out that changed operating and mechanical conditions have made necessary the use of higher melting point greases in many cases.

While, according to Maag, there are places where the lime soap greases are giving entire satisfaction, the higher melting point greases have been brought into use largely because of the following conditions:

(1) The advent of four-wheel brakes.
(2) Higher speeds and more braking.
(3) High speed cross-country buses.
(4) Trackless trolleys.

The higher melting point greases will be required, according to Maag, until better engineering and more effective cooling produce lower operating temperatures.

It was brought out that the makers and marketers of greases desire only one product for all types of wheel bearings, and that it is therefore necessary that the lubricant take care of extreme operating conditions such as extreme loads, excessive speeds, and high operating temperatures. Maag stated that the grease must also be of a texture and fluidity or consistency to feed on and into a bearing under all operating conditions. It was pointed out that a heavy film of lubricant is not needed for anti-friction bearings. He said:

"In fact the bearings always run cooler with a light film. However, we must guard against staying too close to the thin film side, as it is characteristic of anti-friction bearings the same as others, to burn up when lubrication fails. For the above reasons, we found it advisable to recommend greases that have high enough melting points so that they are not too thin at the highest temperatures encountered, and will also be soft enough at the lowest operating temperatures. Experience has shown that a soda soap grease, or a mixed lime and soda soap grease properly compounded, will more nearly meet most operating conditions and one grease usually is satisfactory for year-round service."

Maag outlined the specifications for a wheel bearing grease that has been working satisfactorily in passenger cars for a number of years, as follows:

"The grease shall be composed only of soaps and oils, and shall be free from fillers and abrasives of any kind. It shall be non-corrosive to bearing parts in service or storage. It shall show no oil separation in storage or service. It shall be a smooth, cold-milled short fibre, soda soap type grease of approximately 15 to 18 per cent soap content.

"There is no objection to the presence of approximately 3 per cent lime soap which will help to give a smooth, non-grainy structure to the grease. The moisture content should not be over 0.5 per cent. The oil should have a viscosity of approximately 300 seconds at 100 degrees F., near zero degrees F. cold test and should be a refined product."

Maag emphasized that the correct lubricant is not all that is required to lubricate wheel bearings properly. It was explained that the lubricant must be properly applied, and the correct amount applied to the units.

Maag stated that penetration readings, as taken in the laboratory now, apparently do not always tell the correct story as to whether a grease will leak by closures.

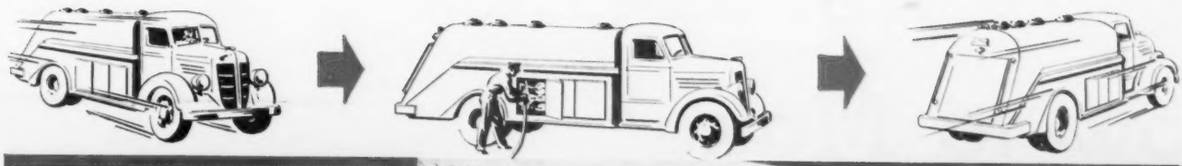
"We feel that a step forward for grease makers would be to have standards for penetration, unworked and worked, also control over changes of these properties with heating and aging. There is also need of a better understanding of what constitutes a long and short fibre grease, and a method for measuring this property, also better control in production. Our own experience indicates poor control over texture of different batches of the same branded product," he concluded.

Texaco Introduces New Premium Fuel

NEW YORK, Oct. 14.—The Texas Co. has introduced a new premium gasoline, Sky Chief, which will eventually replace Texaco ethyl gasoline throughout the country, it is said here.

It is said the new gasoline will be over 80 in octane number. While the fuel will contain tetra ethyl lead, the company's promotion campaign, it is said, will not feature this. The company describes the new fuel as "combining a 10 per cent point and 50 per cent volatilization favorable to extremely quick starting and acceleraton, with complete freedom from knock or 'ping' under all usual conditions of average driving."

The first announcement was made by The Texas Co. of the new motor fuel in Baltimore Oct. 4 and it is said it will be available throughout New England and the east coast and the Pacific Coast by Oct. 15.



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Smith Meter shown above is Model TL-150 for unloading gasoline by either gravity or pump operation. This compact unit equipped with full 2½-inch outlet materially shortens the delivery time. The maximum rate of flow is 150 g. p. m.

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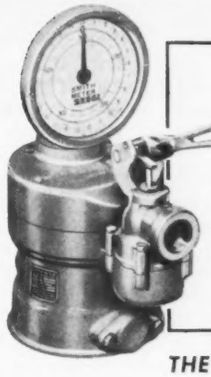

Smith Meter Model 3T-40, equipped with vertical dial, can also be furnished with horizontal counter and set-stop valve for predetermined deliveries. Maximum capacity 50 g.p.m.

THE SMITH METER

1. A rotary, positive displacement meter.

2. Has low energy consumption. Operates on either gravity or pump.

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How to Make A Station Pay

Republished, and somewhat abbreviated, from the August, September and October issues of the Continental Oil Co.'s Red Triangle

In these days of relatively lower gallonage per station outlet, with many oil marketing companies and owners and operators of individual stations looking for added lines of merchandise to take on or other propositions for increasing their business, there is much sound advice in a discussion which has been appearing in the Continental's house publication.

"The way is wide open for a large number of practical operators to create an unusual degree of distinction for their respective outlets by studying to improve the service station—rather than by trying to branch out into a lot of extraneous lines of merchandising with which they are not familiar and of which there is already an oversupply," states the conclusion of one article in this discussion.

To succeed, a new proposition taken on by a station, it is stated, must be one that fits in with the present business, which will tend to increase the net profits and which can be handled within the limits of the earned surplus of the business.

THERE are certain rock-bottom fundamentals of doing business which apply just as concisely to the management of a three-pump service station in Devil's Lake, North Dakota, as they do to the management of a hundred-million-dollar corporation.

A great many Conoco Mileage Merchants have managed their enterprises in a fundamentally sound way, and have been successful. Some of them have done amazingly well, and have grown to be very important distributing units in their respective localities.

We never join hands with a new dealer without looking him over and wondering if he is going to prove to be one of the truly great and influential retailers of the next twenty years. The possibility is always there. The only thing that limits him is his willingness to adhere firmly to the principles of good business. He need not be limited by small capital—the Continental Oil Company had very little capital in 1875, less than that now controlled by many small service station owners.

He need not feel limited by being located in a small town—J. C. Penney got his start in a poorly located store building in a dusty Wyoming cow town.

He need not be limited by lack of education or experience—one of the most successful MERCHANTS in Oklahoma cannot write his own name, though he has built up a great institution and is rated in the millions.

The man himself is his only limitation. That, unfortunately, turns out to be a very severe handicap in many cases. It is true, revealed by a study of Bradstreet's figures for a period of more than eighty years, that more than 90% of all retailers fail to keep their frail barks sailing on the sea of business for more than five years. And other surveys, confirming Bradstreet's observations, split the figures down to individual enterprises and tell us that only grocers are more likely to close their doors than are filling station operators.

We could cite a great many facts and figures to support the bald statement that turnover in service station management is large and that much human misery is caused by this fact. It is enough to say that when a retailer fails, in a very large percentage of the cases, it is because he did not observe and follow some one of the fundamental rules of doing business.

The rules for doing business are plain, and the penalty for their violation is certain and severe. They are not like laws passed by legislators. They do not have to be enforced. They enforce themselves. They are like the law of nature which says that water cannot run up hill.

EVERY BUSINESS MUST LIVE WITHIN ITS INCOME. We are inclined to think that this is the first and most imperative of all the laws of doing business.

Live within your income. Take less out of the business than it is earning. Leave part of the surplus in the treasury for expansion and development.

To use an illustration involving very small figures let us say the service station retailer starts out with a capital of $500. He sells enough gasoline and oil and grease jobs, in an average month, to earn a gross profit of $350. Then expenses, overhead, come in. By the time these are subtracted there is a net of just $100.

Now, what this man should do is to pay himself a salary of $90 a month, leaving a surplus of $10 in the business to develop it—to enable it to grow. If he follows out such a program strictly, religiously, then by the end of the first year he will have $620 of "working capital." Maybe he can employ this to do a better job of advertising, which will bring in more business; by the end of another year he might have as much as $800 of working capital.

So the thing can grow. And it is just as important for the little fellow in the corner station to conserve his $10 a month as it is for the big corporation to watch after its thousands.

The rule about living within your income—sometimes called the RULE OF CONSERVATION OF SURPLUS — cuts in three different ways.

First, after a business man has surveyed the possibilities and has decided that he is entitled to a salary of, say, $90 and that this should leave a surplus of $10 per month, it becomes one of his most important tasks to see to it that this objective is attained.

IF HIS records show he is making money at a rate which will permit him to pay himself his $90 salary and put $10 or a little more into the surplus account, everything is all right and should not be changed. If, however, he sees from the daily sales sheet, or from the balance drawn up at the end of the month, that he is not going to make a net of $100 for the current month—then something must be done immediately.

Basically, there are just two things he can do—increase sales, profitable sales, or cut down expenses. Cutting down expenses is a very difficult thing, either for the big corporation or for the small individual, but occasions arise when it must be done.

And unless every other possible cut has been made, *that little* $10 *for the surplus account must not be cut.* He should cut his own salary first, economize on small expense items, regretfully inform his employe that he must take a couple of dollars less per week—but do not cut down the monthly con-

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tribution to the surplus account until forced to it by absolute and overwhelming necessity.

After all, the purpose of being in business is to make money, and if the business can't make money—can't accumulate a surplus—it has no reason for being there.

The *second* activity in conservation of business surplus is to resist the importunities of salesmen who are trying to sell additional pieces of equipment or additional lines of merchandise.

Every salesman believes he has a good proposition to offer a merchant; if not, he should not be a good salesman. Practically every salesman is worth listening to, because he travels around, observes other dealers, has facts and figures at his command which may prove to be of value to any merchant who will listen to him with an open mind. The salesman who represents lines the dealer is already handling is always a good man to talk to, as he knows new and up-to-date methods of increasing sales and handling other problems which beset every retailer.

But every retailer should be on his guard against the salesman who wants him to buy a new piece of equipment or who wants him to expand his activities to include the handling of new and different lines of merchandise. The rule is: Listen to him, get his story, but don't buy from him—very often.

The reason for that is because the average dealer has not yet reached the point where his own capital and surplus position justifies him in taking on other lines or making major increases in his equipment investment. Time and time again we have seen a very promising station go broke for the reason that the proprietor took on a line of tires, batteries, accessories or other merchandise which spread his capital out too thin and shortly he had so much money tied up in merchandise that he could not pay his bills.

A retailer does not have to worry about this *third* activity until the time when he had actually accumulated a respectable sum in his surplus account. Say the dealer who has been in business for two years has built up his position until he has a total capital and surplus of $800 . . . or $1800 . . . of which two or three or five hundred is dormant in the bank, not doing much positive good for the business. Also let us imagine his volume has grown somewhat and he is regularly putting, not $10 but $25 or $100 into the surplus at the end of each month's business.

Now, the *third* question comes up—what to do with such surplus funds.

One thing the retailer can do under such circumstances is to raise his own salary. "The family probably needs it and is entitled to it," succinctly comments the Red Triangle, at this point. Another is to look into the matter of accepting a number of charge accounts from responsible people. Here the retailer must know that he has the necessary capital to invest in credit business.

A third thing the retailer can do is to invest, cautiously, some of his surplus funds in improving or replacing his equipment, with new types that will increase his business. A fourth is to increase his advertising appropriation. No dealer should increase his advertising expenditure, it is pointed out, unless he knows where the money is coming from.

The thing any retailer can be sure of is that, as his surplus account increases, as his ability to do something in the way of expansion becomes noised around, the pressure upon him will become terrific. Real estate men will be after him to buy or rent a new station. The equipment men will be after him to buy shiny new gadgets up to and exceeding the whole of his capital. The tire and battery men will hide behind his bed and pop up from beneath his table.

He must learn to say—no.

He must learn to say no, unless and until some one makes him an offer of a proposition which fits in with his present business, which will tend to increase his net profits, which he can handle within the limits of his earned surplus.

Show us a man who handles his business affairs according to this rule when he is small, and we shall show you a man who is going to be a very big and successful operator within ten or fifteen years.

"Know Your Business" Success Rule for Retailer

One of the basic requirements for success in any retail enterprise can be expressed in three words — KNOW YOUR BUSINESS.

We are not going to say that a man must absolutely have started pumping gasoline at the age of fifteen in order to make money in a service station. That helps, to be sure. But there was the case of a school teacher out in the Texas Panhandle who saved $1100 and bought a service station.

Over the years this man has done extraordinarily well, even though he had to be told the difference between a transmission and a crescent wrench on the day his station was thrown open for business. He was an intelligent fellow, though, and most of his first year was spent in an intensive study of automobiles, oils, fuels and greases. He had to forget his fractions and his Latin verbs and learn something about the oil business—in a hurry—in order to have a first faint chance to succeed.

The laws of doing business do not assess the extreme penalty against a man who has no previous experience, in other words, but they do "throw the book" at any careless or indolent individual who fails to build up his knowledge of his particular line of business, just as fast and just as thoroughly as possible.

There are endless examples of how trying to learn a new business handicaps a going concern. The operator of a chain of retail service stations was sold the idea of adding tires, batteries, spark plugs and several other accessory items to his stock. Here again the argument was that he already had the floor space and the retail salesmen—why not add to his profits by diversification? Why not try to supply the customer who came in for gas and oil with others of his definite automotive needs? The argument sounded good. At any rate, he bought—made a stock investment of nearly $40,000 and a further investment in equipment of about $12,000.

The first difficulty to be faced was that of teaching his station men the technique of servicing and selling tires and batteries. Later this was complicated by the addition of heaters and radio sets—each with its peculiar and different sales and service problem. Night meetings were held, and a lot of money was spent trying to teach employes the new lines.

But after nearly three years, it was still true that these men—very good service station men at the beginning—were still woefully inept in their mastery of the "tricks of the trade" in connection with the new merchandise they had to handle. A tire dealer who was in direct competition with two of the stations in the chain laughed at their efforts. "They bother a little now and then," he remarked, "but my men can sell circles around theirs. They simply don't know the tire business."

In spite of their difficulties, some sales of tires and other items were made, and the first profit sheets drawn up on the revised operation looked good. At the end of three years, though it began to be plain that a heavy loss on obsolete radio sets, trade-in tires, shop-worn batteries and useless equipment had to be charged off.

Another thing which had not been considered at the beginning was a very materially increased overhead cost. Bookkeeping charges alone mounted more than 25%, warehousing cost increased, an expert accessory man was eventually employed whose salary and expenses ate up the greater part of the increased profit.

And—saddest fact of all—at the end of three years the figures showed a very decided decrease in average gasoline sales per station, in oil ratios and in number of grease and wash jobs. These good service station men, with their attention and energies diverted to the sale of other items, had no time left to do what they were there for in the first place.

The service station business has as its primary purpose the sale of gasoline, oil, wash and grease jobs. In that

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. . . to bring you new customers

. . . to build your profits

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THE eye-brightening beauty of a Pittco Front beckons to the passers-by. Gleaming surfaces of glass and metal inform them that "this station is modern" . . . bring them into your station to buy. And what a difference a Pittco Front will make in your business! Ask any owner how it helps to make new customers and build profits.

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line of activity many men have made money. They have learned their business — set themselves up as neighborhood authorities and experts in the problems of lubrication—and have done well. It is not exactly an easy task to learn all there is to be known about automotive lubrication and about the kind of service a customer wants when he buys gasoline, but an ordinary intelligent man can learn it—can get himself to the point, in a reasonably short time, where he KNOWS HIS BUSINESS.

At that point, if he works hard and conducts his enterprise in a business-like manner, he begins to make money.

Now, when a business man begins to make money—begins to accumulate a surplus—the problem always presents itself as to what kind of expansion of his activities is wise and prudent. Generally speaking, it is much better for such a man to expand by increasing his present business than to venture off into fields which he does not know. It is better for the shoemaker to stick to his last.

Specifically, the addition of better lubricating equipment always brings in more business, and that is a better investment for a service station man to make than putting in a line of fan belts. Again, increasing the radius served by pickup and delivery service or by extended advertising effort will always bring in more gasoline and oil customers—and that is usually a better move than cluttering up a station not designed for such purposes with a stock of tires and batteries.

Carrying the cycle of progress and expansion to its full extent, the dealer who has made a goodly sum of money in a small station is always wiser to look for another station, in a similar neighborhood, where he can duplicate the success he has made in his first place of business. He is more likely to succeed in building up a chain of small stations than he is to succeed in the management of a large single station in which he is required to handle a wide assortment of merchandise that he does not know anything about.

We have said that the first rule for conducting a retail store—or any other business, large or small—is to build and conserve a surplus. The second rule was very shortly expressed in three words: Know Your Business.

To pick out the third rule, if we try to keep them in the order of relative importance, becomes an almost impossible task. No one knows whether it is more important for a retailer to advertise or to watch his credits and collections. No one is competent to say that keeping a good set of books is more necessary than giving good service, or vice versa.

All these things, and some others, are important—they are more than important, they are vital—and the retailer who fails to do a job in any one of them is heading for failure, or at most a very slim measure of success.

So, with no attempt to imply that it is any more important than six or seven other activities around a retail establishment, we are going to say that the third rule which a storekeeper must observe is that he must have an aim, a plan, an objective.

Have a Working Plan Built Around Improving Your Station

PLAN YOUR WORK AND WORK YOUR PLAN. That is an old, trite saying, but it is just as living and energizing an influence as can be brought to bear upon the conduct and management of any kind of a business, great or small.

We think it deserves stress for two reasons: first, it is a sad fact that very, very few service station operators have a very definite plan or policy which they have laid out for the conduct of their business; second, increasing competition and better merchandising methods used by others make it more necessary today than ever before for a retailer to look ahead and try to make out just where he is going and by what means he expects to get there.

We know a young restaurant owner who started his business career in a small lunch room out on 31st Street near the car barns nearly fifteen years ago. Before making his down payment this man had a plan. He would tell anyone interested enough to listen that he fully intended and expected some day to own a chain of eating houses reaching from coast to coast.

To show the extent of his planning, he spent more time and thought on the matter of a bookkeeping system for his first little lunch room than most men are willing to spend on the whole problem of management. He set himself the task of laying out a system which would be adequate, not merely for one small restaurant, but for the huge organization with a hundred locations and a thousand employes which he ultimately hoped to control.

His plans, looking to a definite and controllable future, have borne fruit. He owns a chain of twelve eating houses today, scattered over the midwest, from which his yearly profits frequently reach the $50,000 mark. He has not yet reached as high as he aimed, but he is far beyond his four original competitors who did not aim at much of anything, and he is still growing.

And the best phase of this whole picture is that the original bookkeeping system is still functioning.

We do not know anyone who has applied that degree of meticulous detailed planning to the problem of running a service station. We believe the industry is crying for someone to do that kind of a job, however. Continental Oil Company is not going to set itself up as an authority on how such a plan should be originated and carried out. That is a project for a service station man, not for a supplier. The plan must be made by a man to fit himself and his business. No outsider has any place in the picture. There are too many varying factors originating in the man, his ability, his previous experience, his family obligations, the market he is serving.

One general, but highly important, principle should govern him—that is, his aim should be high. It certainly cannot be true that anyone ever hit a high mark by aiming low.

Another consideration of value, however, is that at least one foot should be kept somewhere near the solid ground and that aims and ambitions should not be permitted to become fantastic. A plan should not, in other words, consist of a vague dream and hope for riches to come. It should be directed to definite measures of attainment, in the line of business in which the man is engaged, including in its scope every practical detail of management.

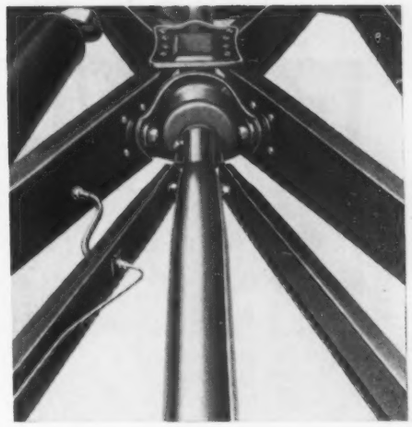
A third phase of planning is to be found in the experience and observation of almost every successful business man, and a good way of saying it is that planning should proceed down the straight road of proven experience and not go wandering about through pastures which may seem greener, but usually are not. Not a few service station men have hazy ambitions in the direction of branching off into the restaurant business, building up grocery stores, entering the tire and accessory business, becoming car dealers and what-not. Taking them by and large, such objectives are not as easy of attainment as the ambition to develop a first-class service station. Any business man's attempt to build himself is hard enough, meets enough obstacles, without going outside the compass of the thing he is doing, knows how to do, has proved he can do well.

Looked at from another standpoint, there is a lack of proper service today in the driveways of the nation's service stations. Taking them as a whole, the efforts of service station men have been too much the butt of cheap humor by writers and cartoonists. We get too much mail from travelers criticizing some phase of the service they have been offered. The way is wide open for a large number of practical operators to create an unusual degree of distinction for their respective outlets by studying to improve the service station—rather than by trying to branch out into a lot of extraneous lines of merchandising with which they are not familiar and of which there is already an oversupply.

SERVICING requirements of new models for Pontiac, Studebaker, Chrysler and Packard will next be discussed in this series of articles in NPN, in which changes in the new cars for chassis lubrication, transmission and differential lubrication and other features are explained and illustrated.

Following its usual editorial policy, NPN will later combine this information and many other articles on automobile servicing in its annual Automotive Lubrication Number.

An article in its Sept. 28th issue explained new features of the '39 Plymouths; an article in the Aug. 31st issue discussed general features of the new models and told some of the car manufacturers' ideas on servicing.

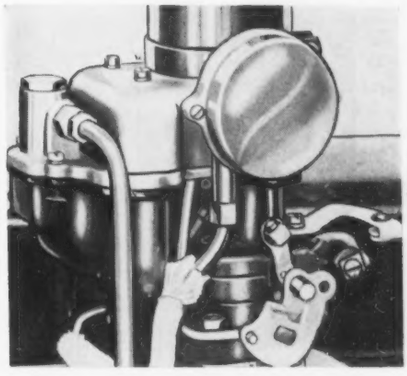


The front end of the torque tube on the Buick 40 and 60, showing rubber insulation and channel strut rods. A pressure gun fitting at the end of the torque tube takes a chassis lubricant every 1000 miles on these two models

Lubricating The 1939 Buick . . .

Automatic Transmission Discontinued; Remote Shift Lever On All Models; SAE 90 Extreme Pressure Lubricant Specified For Transmission.

By John W. Thompson
N. P. N. Staff Writer



Buick engines are equipped with a fuel conditioning system which assures a steady supply of fuel to cylinders. An improved accelerator pump furnishes proper mixtures for quick acceleration at slow speeds, and a positive acting choke, built as an integral part of the fuel conditioner, eliminates extra linkage to the choke valve

BUICK introduces four eight-cylinder models for 1939. One of these models, the Series 40, uses an engine that develops 107 horsepower at 3400 r.p.m., while the other three models, the Series 60, 80 and 90, all use an engine which develops 141 horsepower at 3600 r.p.m.

In its front end design for 1939, Buick has adopted what it terms "catwalk cooling", in which the grilles are set in a rakish contour in the catwalk section of the front end. This greatly narrows the hood effect, and brings air to the radiator at greater pressure.

Buick has discontinued the automatic transmission it introduced last year, and in its place has adopted as standard equipment on all models a shift lever under the steering wheel. This is a manual shift. Included on the shift lever is a small throw switch which operates a directional signal at the rear of the car to indicate the direction of a turn.

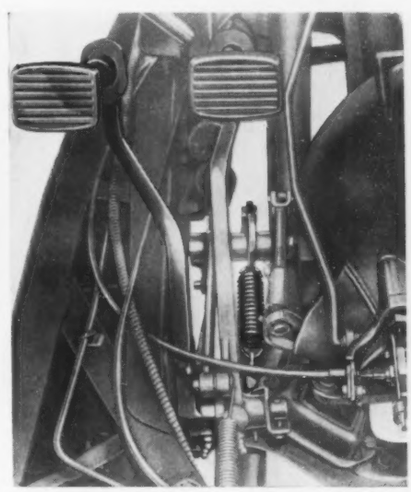
The independent front wheel suspension using coil springs is continued, and on the Series 40 and 60 the front suspension geometry has been improved to provide steadier but lighter steering.

Buick continues with its coil rear springs, introduced last year. These torque-free springs have been improved to provide better stability through channel section strut rods.

Buick offers two body novelties for 1939. One is the sliding top, drip-proof and rain-proof, which provides sun and sightseeing advantages for closed cars. This is available only on certain models. On the Series 40 and 60 stream boards may be had in place of running boards, as optional equipment, to intensify the streamline appearance of the cars.

All models are again equipped with hypoid rear axles, this year with two optional gear ratios available on the Series 40 and 60. For use in hilly country, the Series 40 offers a rear axle ratio of 4.4 to 1 and the Series 60 a 3.9 to 1. For level country, where the demand is for maximum fuel economy and higher top speed, a ratio of 3.9 to 1 is provided for the Series 40, and 3.6 to 1 for the Series 60.

A new fuel conditioning system has an improved carburetor with an accelerator pump which is said to readily furnish ideal fuel-air mixtures for fast acceleration, particularly in low gear. It also provides the proper air-fuel



Clutch and brake pedals are mounted on the frame of the 1939 Buick. All models this year have a clutch booster spring which reduces clutch pressure

FOREMOST IN THE SOUTH WEST

Drive anywhere in the country . . . down to impressive Boulder Dam, for example . . . and you are certain to find the ever-present roadside gasoline pump. We are proud that inside the great majority of these pumps, Leland motors are operating with extra-quietness, extra-efficiency, and extra-dependability.

These characteristics have made Leland gasoline pump motors world famous. They are responsible for Leland's unequalled sales record . . . outselling all others combined for 17 straight years.

If you have not already standardized on Leland motors, follow the lead of those who do. Obtain one for test and find out why they are unexcelled for all gasoline handling operations. The Leland Electric Co., Dayton, Ohio.

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LEADER FOR SEVENTEEN STRAIGHT YEARS

ratio for different loads and air temperatures.

A new automatic choke has been developed for Buick which is an integral part of the carburetor, eliminating extra linkage.

New intake and exhaust manifolds are used with the new fuel conditioner. Intake manifolds are shaped to insure even distribution and free flow of fuel mixtures to all cylinders. Heat is applied to the intake manifold by means of an automatic thermostatically controlled valve, in order to induce better fuel vaporization, especially when the engine is cool or on part-open throttle.

THE water pump is made leak-proof by the use of a new carbon block type of shaft seal. In conjunction with this seal there is a new lubricated-and-sealed-for-life ball bearing assembly on the water pump shaft, which requires no further lubrication attention. This eliminates from servicing one point which last year required lubrication attention every 1000 miles. The engine can be reverse-flushed without damaging the seals of this new water pump.

The new crown spring clutch in the 1939 Series 40 is entirely new. Its entire assembly has only nine parts, compared to the 41 parts in the 1938 assembly.

The parts in the 1939 Series 60, 80 and 90 clutch which may be subject to friction, and also such parts in the clutch release mechanism of all series of models, are protected from loss of lubricant by a special process of coating.

By producing chemically an overlaying coating which also penetrates and becomes integral with the surface, a smooth but matrix-like porous finish is created on the part being treated. The part is then dipped into a solution containing oil and graphite, which is retained by the porous surface as a practically permanent lubricant.

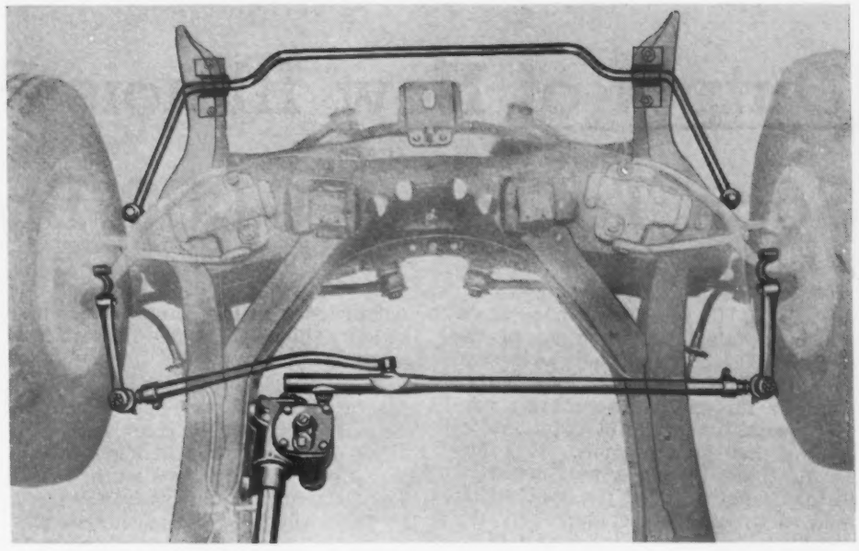
The gas tank filler cap is concealel below a spring closed door in the rear left fender, as it was in the 1938 Buicks.

The Buick hood opens from either side, with each top section being held in place by a bow-latch, the handle of which is concealed and is an integral part of the side louvre design.

Simplified air cleaners, with improved intake silencers, have been developed, and the Series 40 for 1939 will use a horizontal type similar to that used on the Series 60.

All new Buicks that are equipped with heavy duty oil bath air cleaners are also equipped with oil filters. The filtering element should be renewed when the oil on the gauge stick appears dark. Under ordinary usage, the factory recommends the filtering element be changed about every 8000 miles.

Buick continues in 1939 with a hypoid axle on all models. Recommendations on the rear axle remain the same, with a drain, flush and refill twice a year, or every 10,000 miles. An SAE 90 hypoid lubricant is specified for temperatures not lower than 10 degrees F. below zero and an SAE 80 hypoid lubricant for lower temperatures.



Buick's front stabilizer and steering control, on the Series 40 and 60. Slight geometric changes in the front end design now put the front wheel stabilizer ahead of the front wheel centerline

The Buick transmission lubricant, while requiring service at the same interval as the rear axle, is slightly changed as to specification for 1939. An SAE 90 extreme pressure transmission lubricant is specified for temperatures not lower than 10 degrees below zero, and for lower temperatures an SAE 80 extreme pressure transmission lubricant is recommended. Formerly an SAE 160 or 140 was recommended for summer and an SAE 90 for winter.

A pedal equalizer shaft lubricant fitting is now found on all models, where formerly it was only on the Series 40. This takes a chassis lubricant every 1000 miles.

As last year, the plug on the front end of the propeller shaft of the Series 80 and 90 should be removed every 1000 miles and 10-W engine oil applied at that point. On the Series 40 and 60, in place of a plug at this point, a special pressure relief fitting is provided which takes a chassis lubricant every 1000 miles.

Lubrication of the front end spring suspension and steering mechanism remains substantially the same as last year, with all points taking a chassis lubricant every 1000 miles. The only change appears in the lower control arm shafts of the front spring suspension system, where lubrication fittings are found only on the Series 80 and 90. On the Series 40 and 60, these lower control arm ends are rubber bushed.

The steering gear is filled at the factory with a special all-season gear lubricant. Seasonal change of this lubricant is unnecessary and the housing should not be drained. The attendant is cautioned against using a pressure fitting in the filler plug hole, as this will force oil up the steering column. A steering gear lubricant should be added up to the level of the filler plug when necessary.

Front wheel bearings should be lubricated twice a year. The wheel, hub and drum should be removed as a unit, and one tablespoon of wheel bearing lubricant applied to each bearing. When the wheel is off, the felt oil seals should be examined for wear or leakage and replaced if necessary.

CRANKCASE oil drain period and viscosity recommendations remain the same as last year, with refills being specified every 2000 to 3000 miles, under "normal driving conditions." Buick points out, however, as it did last year, that "your driving, local conditions and temperature must furnish the basis for deciding how frequently the oil should be changed."

In specifying the grade of oil to use in its engines, Buick states that the oil should be selected not on the basis of the existing atmospheric temperature at the time of change, but on the anticipated minimum temperature for the period during which the oil is to be used.

Following is Buick's engine oil recommendation:

Minimum atmospheric temperature anticipated	Grade of oil
Not lower than 32° F.	20-W or SAE 20
As low as 10° above zero..	20-W
As low as 10° below zero..	10-W
Below 10° below zero ...	10-W plus 10% kerosine

Capacities, without exception, remain the same as last year, as follows:

	Series 40	Series 60	Series 80, 90
Gasoline tank; gals.	18	18	20
Cooling system; qts.	13¼	17	17
Transmission; pts.	1¾	2½	2½
Differential; lbs.	3	3	4
Crankcase; qts.	6	8	8

Output of New Illinois Pools Soon To Top 100,000 Bbls. Daily

THE same brisk pace of development that has gone on in the new oil fields in the Illinois coal basin the past few months is expected to continue throughout the coming winter except for such interruptions as the weather may provide. That factor at times proves a real deterrent in that country and it is possible that mud and low temperatures in the months to come, will tend to flatten the rapidly climbing curve of daily production.

Right now, total daily output of the state is knocking at the door of the 100,000-barrel daily figure. Of the total, about 13,000 barrels daily are credited to the old Illinois fields.

Predictions of peak production are heard. Some guess that 150,000 barrels daily will be the top for the new fields. By new fields is meant the crop that has come on since late 1936, when the Bartelso pool, in southern Clinton county was discovered. Some other guesses go as high as 200,000 barrels daily.

In September, 1937, this writer brashly predicted that the 25,000-barrel mark would be reached by the end of the year. That came true, for a day or two. That was before the Centralia pool, with its townsite drilling, came along and most of the attention was given to the deeper McClosky lime campaign then going on in Clay, Richland and Wayne counties. That area is still quite active but is overshadowed in public and oil industry interest by the shallower sand campaign at the west side of the basin, which has resulted in such pools as Louden, in Fayette county, and Lake Centralia, in Marion county, the latter shown on the accompanying map as the Salem pool. It is also referred to as the Texaco, for its discoverer, The Texas Co., and the Tate, for the farm on which the first well was drilled.

The degree of activity in Illinois is indicated by the fact that in September there were 250 completions, of which 189 were oil wells. The state was ahead of Oklahoma and Kansas in operations. Oklahoma's completions totaled 177, of which 109 were oil producers; Kansas had 139 completions, including 91 oil wells.

In "first reports", or locations, rigs and new wells started, Illinois was again ahead, with 289 against Oklahoma's 201 and Kansas' 109.

Illinois' completions in September resulted in 75.6 per cent oil wells, while Oklahoma had 61.5 per cent oilers and Kansas 65.4 per cent. Gas wells are not included in the percentage computation. Illinois gets few of that kind of completions.

In the first eight months of 1938 the record in Illinois was 80 per cent oil wells of the 959 wells completed. The effect of successful drilling in Centralia and other fields that had been found is shown in the comparison with all 1937, when 449 wells were completed in the state, of which 65 per cent were oil wells. In 1937 the basin area was in the early exploration stage and numerous dry wildcats were drilled, as is usual in new territory. Wildcatting continued in 1938 and to this time, but a greater percentage of the drilling was on locations that were proved.

Exploration work continues but it tends more to be established on the basis of geology. As is customary in new producing provinces, many wildcats were drilled without benefit of science. Some operators played "trends"; some just went out and got a block of leases, sold enough acreage to finance a well and went to work. This kind of wildcatting finally runs its course; it hasn't been finished yet in Illinois, but it is waning.

Those who believe in it and those who can afford it—the two requirements go together usually—are working their acreage in advance of drilling. Geophysics has played a considerable part in the come-back of Illinois. A late report was that 12 seismograph parties were working in the Illinois basin, southwest Indiana and western Kentucky, most of them in Illinois.

There has been a preponderance of independent operations over those of major companies in Illinois this year. The Centralia townsite play and territory adjacent thereto was one that was wide open, with little acreage in the hands of any one operator. This is another trend that will be interrupted, perhaps reversed, before long, with the Centralia drilling past its peak and the known and undeveloped reserves in other places more solidly held by major companies. The recent reductions in crude oil prices also will have their effect on independent drilling.

That may not be the case with major company operations. It is one thing to be in the producing business exclusively and quite another to have refineries and pipelines in conjunction with producing operations. In the instance of Illinois, the major companies that are in the play are those that have refineries in Illinois, Indiana, Ohio. It is a case of shifting part or all of their drilling from the Mid-Continent—Oklahoma and Kansas—to an area nearer their principal refineries.

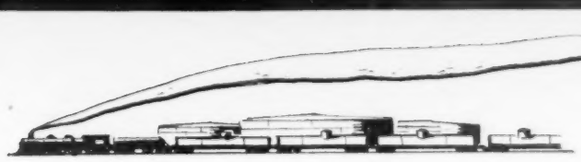
Thus, the Carter Oil Co., producing and buying crude oil for several years in Oklahoma and Kansas for the Standard Oil Co. of New Jersey; Pure Oil Co.; Standard Oil Co. of Ohio and Imperial Oil, Ltd., moved into Illinois and Indiana in a big way. So did The Texas Co. Shell Petroleum Corp. is active, Gulf Oil Corp. recently put in a division office in Indianapolis. Magnolia Petroleum Co. is developing a part of the Louden pool and has other operations; its nearby refinery affiliate is the Lubrite plant at East St. Louis. Pure Oil Co. was the first to get production, among major companies.

Despite the 20-cent cut in Mid-Continent crude and a reduction in tariffs on Mid-Continent oil by Oklahoma Pipe Line Co. and connecting carriers, Illinois still holds the advantage, in the lower cost of crude produced there to refiners in that territory and even further east, and will likely continue to do so.

HOW substantial has been the contribution of Illinois to the decreased demand for Oklahoma and Kansas crude is shown by the U. S. Bureau of Mines figures for this year, through August. Production in the two Mid-Continent states declined 44,446,000 barrels in the eight months compared to the same period of 1937; Illinois gained 7,970,000 barrels. A further contribution to taking up this slack in the Mid-Continent was made by Michigan, with about 3,000,000 barrels gain in production in its fields over the January-August period of 1937.

Illinois production would have reached a higher mark this year except for limitation of pipeline outlet. The bottle neck existed at Centralia. To get around this congested point, other companies than the Illinois Pipe Line Co., sole carrier of oil out of the state, laid short lines. The Texas Co.'s prize pool east of Centralia — the one that is known by several names, including Salem,—sent its crude out through a line to Sandoval, a station on the Illinois system. The Owensboro Corp. laid some line and there was some oil moved out by tank car, both to destination and to a receiving point on the Illinois pipeline system. Because of these conditions, there was limitation on the amount of oil purchasers bought from leases.

There has been a limit set by Carter Oil Co. on the crude it produces and



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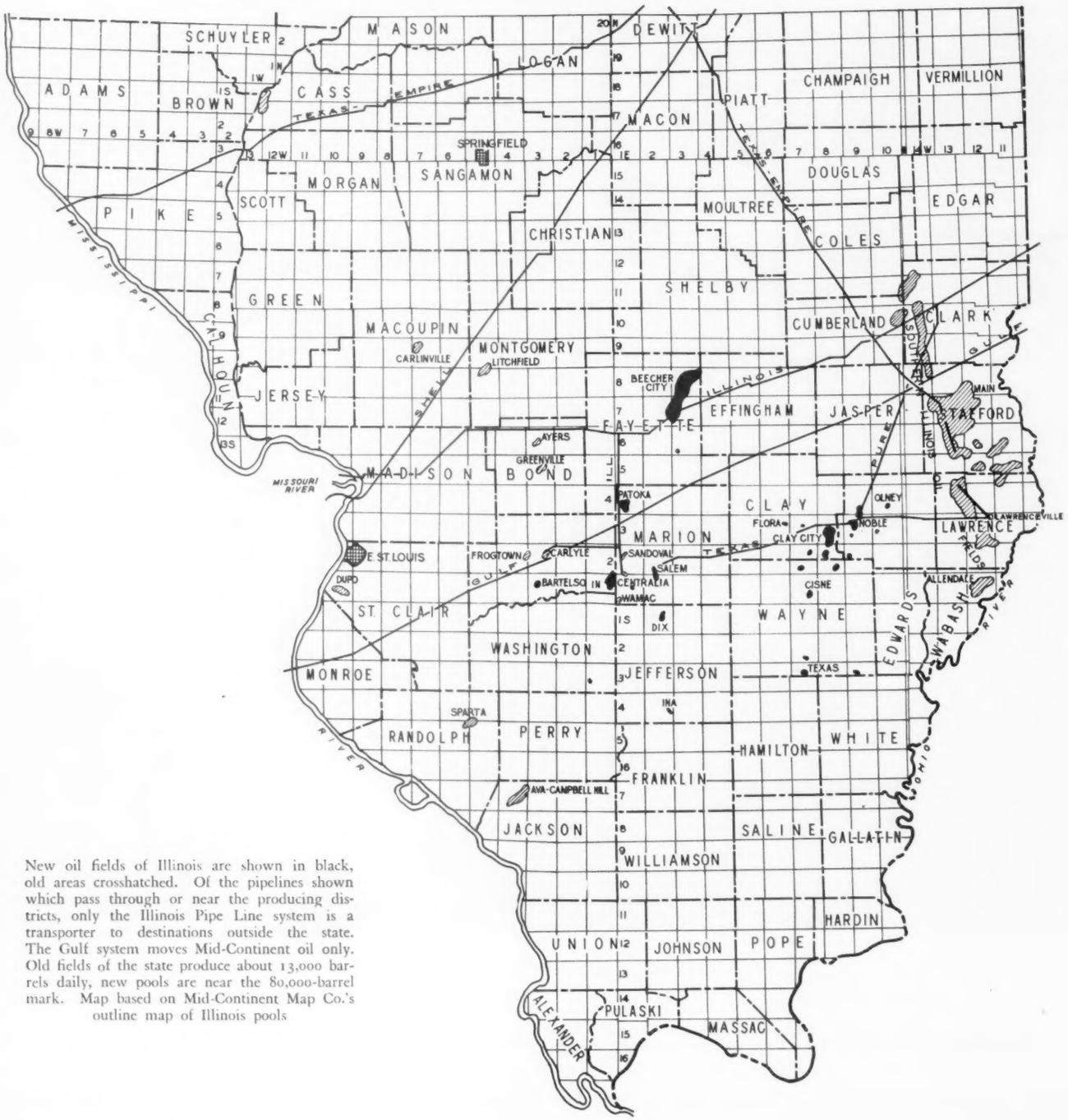
Carteret, N. J. (Port of New York)
Galena Park, Tex. (Port of Houston)
Corpus Christi, Texas

Map of New Illinois Oil Fields



New oil fields of Illinois are shown in black, old areas crosshatched. Of the pipelines shown which pass through or near the producing districts, only the Illinois Pipe Line system is a transporter to destinations outside the state. The Gulf system moves Mid-Continent oil only. Old fields of the state produce about 13,000 barrels daily, new pools are near the 80,000-barrel mark. Map based on Mid-Continent Map Co.'s outline map of Illinois pools

buys in the Louden pool but this has been chiefly for conservation reasons. Carter has attempted to do in this pool what many producers have urged upon the regulatory bodies of the states having conservation laws; namely, make the production of crude bear a definite relationship to the size of the tract drained. It has sought to hold back daily production so as to increase the ultimate yield of crude oil, making more effective use of reservoir energy.

Carter's drilling program in the Louden pool calls for two wells to each 40 acres and with its first price posting Sept. 1, it set a maximum of 40 barrels per well, with a maximum of 80 barrels daily from a 40-acre tract, regardless of the number of wells drilled thereon.

The plan is being followed, although deviation from it has been necessary in a few instances where other operators adopted closer spacing. In the other fields of the state, 10-acre spacing is the custom, except in townsite plays where no rule at all is in effect.

The pipeline situation is getting squared away. About the middle of November, the Central States Pipe Line Co. (The Texas Co.) expects to have ready its new trunk line from Salem to Lawrenceville. This is a combination eight- and 10-inch carrier. Crude that The Texas Co. heretofore has sent roundabout through the Illinois company's line will go the short way to the plant of the Indian Refining Co., subsidiary of The Texas Co., at Lawrenceville. It is expected that 15,000 barrels daily will be available as soon as the line is ready. In the event of a greater production than the requirements of that refinery, the surplus could be sent by pipeline into the Chicago district, as the direction of flow in the Texas-Empire Pipe Line Co. trunk could be reversed. That line is a spur from the main line from the Mid-Continent to Chicago, joining the main line at Heyworth station, south of Bloomington, Ill.

Gulf's trunk line which cuts across

YOUR OIL OR GREASE CANS...

HEEKIN welcomes the problem of redesigning or creating a new metal container for you. Our customers in the oil industry know how Heekin colors last under the most adverse conditions . . . retaining all the original color luster and strength. No matter the size of the container or the purpose, Heekin offers you every service . . . without obligation.

THE HEEKIN CAN CO. Cincinnati, O.

the Illinois basin area has not carried any Illinois crude. This is the main line from Oklahoma to eastern Indiana where crude is delivered to connecting lines for movement to Cincinnati, Toledo and Pittsburgh, locations of Gulf refineries. In the event that Gulf develops substantial production in Illinois, doubtless a tie-in to this system would be provided.

As will be noted on the accompanying map, there is a considerable space between the lime pools of Clay, Wayne and Richland counties, and the shallower sand pools in Marion, Clinton and Fayette counties. What lies between hasn't been indicated. There has been considerable wildcat drilling in this area but much of it has been of the hit-or-miss variety. The lime pools of Clay county are in almost the deepest part of the basin. There is a gradual rise to the west and a flattening of the beds from Centralia west. To the south, some assert they find no encouragement to prospect beyond Saline and Gallatin counties or north of Christian and Moultrie counties. There is no present extraordinary interest in the territory west of Clinton county.

Possibilities of deeper pays in the Illinois basin, corresponding to the Trenton lime of northwest Ohio and eastern Indiana, and the Viola lime and Wilcox sand of Oklahoma have not been explored on known structure. It is probable some tests will be made later, but the present campaign is directed at shallower horizons and that campaign may easily last two years more.

Insecticide Standard Accepted by Over 500

WASHINGTON, Oct. 14.—The commercial standard for household insecticide (liquid spray type) has just been published by the National Bureau of Standards as Commercial Standards CS72-38 and is available from the Superintendent of Documents, Washington, D. C., at 5 cents a copy.

General requirements of the insecticides are that they be harmless to man and animals, will not stain, will not corrode metals, are free from objectionable odors and have a flash point above 125 F. in the Tag closed cup.

The 14-page booklet briefly outlines the methods of test for determining the above requirements and includes the Peet-Grady method for determining efficiency of contact liquid insecticides. The standard became effective June 10, 1938, less than a year after the National Association of Insecticide and Disinfectant Manufacturers requested its establishment. The booklet also contains a list of over 500 organizations and individuals who have accepted the specifications as their standard.

0.48 Cent a Gallon Extra Net Profit

A selected list of accessories, developed over two years by testing item by item, adds 0.48 cents net profit for each gallon of gasoline sold by Albert Grimes, a Sunoco dealer of Newton, Mass., according to the Sun Oil Co.'s publication. He keeps away from slow-moving accessories by refusing to stock an item until he has first tested out its sales possibilities.

The items included in his list at present and the extra profit each represents, after all overhead charges, on a per gallon basis are as follows:

Item	Cents
Bulbs	3/100
Spark plugs	3/100
Tires	11/100
Batteries	12/100
Air cleaners (service)	5/100
Purolators	2/100
Miscellaneous	12/100
Total	48/100

Jobber's Anniversary Occasion For Good-Will Message

IN SMALLER cities and towns, where interest in local matters runs higher than in larger centers, birthdays and other anniversaries of business institutions attract attention. Oil jobbing companies in many cases have used such occasions to bring themselves before the community in the role of the home-town enterprise.

The Westland Oil Co., independent marketer, recently celebrated its tenth year in Minot, N. D., with the theme; "We're Glad We Came."

Westland Oil was organized by R. J. Coughlin back in 1919, but this year is the tenth anniversary of the company's headquarters in Minot. It started in business at Scobey, Mont. in the pre-railroad days, when petroleum products were hauled cross-country by dray 75 miles from the nearest railroad siding.

The company expanded through Montana and North Dakota and, ten years ago, a compounding plant and office building was constructed and the main office moved to Minot. The transfer brought a new industry to Minot, 11 new families, and a $45,000 plant investment.

To mark this tenth anniversary Westland Oil took a page in a late September issue of the Ward County Independent, to acknowledge its thanks to Minot. The headline read, "Ten years of progress in Minot . . . we're glad we came." The sub-head read "For ten years of pleasant association we thank you."

"Yes folks, ten years ago Westland Oil Co. built its new home and moved the Westland family to Minot," the advertisement began.

"Our decision to make Minot our future home has proven a wise and happy one. Through the advantages of Minot's central location and splendid shipping facilities we have been able to expand the distribution of our products into a much larger trade area and at the same time give better service to our many thousands of customers in North Dakota and Montana.

"Westland employes and families who moved here ten years ago, and those who have since joined our family circle are proud to claim Minot as their home. They appreciate the benefits that Minot offers in good schools and churches, beautiful parks and numerous recreational activities, along with the many other advantages which make Minot a real place in which to live.

"The progress Westland Oil Co. has made in Minot in the past ten years justifies our feeling that we have been well accepted as your friends and neighbors and we want all Minot folks to know that we are truly grateful for the friendly reception and generous support which they have accorded us. We have made every effort to merit this reception and support and are looking forward with security and confidence for continued development and progress for Minot and this territory."

In the same issue the Ward County Independent accorded news space to Westland's tenth anniversary in Minot, with a front page write-up and reprinted the story of the company's moving to Minot from the 1928 files.

The newspaper story noted that the headline in the advertisement is; "We're Glad We Came."

"Were the writer of the advertisement not so modest," the newspaper story continued, "he might truthfully have said, 'Ten years of progress in Minot—and Minot is glad we came.'

"In truth, Minot is glad that President R. J. Coughlin and L. C. Lindemann, secretary-treasurer, and their associates late in 1927 decided that, because Minot was a more advantageous point than Scobey, Montana, where the Westland Oil Co. had its origin, they would 'throw in' with us here, to use a truly western expression."

Sure-Fire

SALESMAN

Cities Service Power Prover wins customers, holds customers and steps up your earnings

CITIES SERVICE OIL COMPANY

Chicago
New York
Cedar Rapids
Boston
St. Paul
Grand Forks
Kansas City
Fort Worth
Tulsa
Milwaukee
Cleveland
Detroit

CITIES SERVICE OIL COMPANY LIMITED
Toronto, Ontario

ARKANSAS FUEL OIL COMPANY
Shreveport, Louisiana

CITIES SERVICE

OILS AND GASOLENES

THE Power Prover—famous "portable laboratory"—tells in a few minutes how an engine is running—analyzes motor performance. It's one of the greatest business builders ever offered to dealers.

Thousands of fleet owners and individual motorists demand this practical service. They report that Power Prover tests and adjusting routine lower fuel and motor oil consumption, reduce operating expenses, minimize minor road breakdowns. The result is high operating efficiency!

Tests on more than a million running motors have verified the value of Power Prover Service. Impressive records show substantial savings on fuels, maintenance and repairs—increased power and efficiency—hence greater customer satisfaction. This means more business, repeat business and bigger earnings for dealers.

The proved-for-profit services of this exclusive Cities Service "salesman" can be yours. Get the whole story—with full details on all the money-making advantages of selling Cities Service Products and Services. Write today!

Listen in every Friday, 8 P.M., E.S.T. to Cities Service Radio Concert, WEAF and 44 associated stations.

Clinic For Field Motor Equipment Is Held at Tulsa S.A.E. Meeting

By Arch L. Foster
N. P. N. Technical Editor

N. P. N. News Bureau

Frank A. Suess, Continental Oil Co., one of the most active of the S. A. E. members in the southwestern group. The untiring efforts of B. E. Sibley of the same company who is vice president of the Fuels and Lubricants Activity of the Society, and of Suess contributed very largely to the success of the Tulsa meetings

T. J. Schuetz, Braden Winch Co. and chairman of the membership committee, southwestern group, who served as chairman of one of the six sessions at Tulsa

TULSA, Oct. 14. — A clinic on the special problems faced by operators of automotive equipment of all types in this important oil producing, refining and consuming territory was held here Oct. 6 and 7 by the southwestern group of the Society of Automotive Engineers.

The problems and methods developed incidental to the operation, maintenance and the proper fueling and lubrication of various types of automotive equipment were discussed in detail by the men who direct the operations of this equipment.

As efficient as automotive equipment has come to be today, a closer, first-hand knowledge by the builders, of the operator's specific problems and a corresponding understanding by the operator of the designer's problems in building equipment to meet specific needs, nevertheless, is conceded to be a sound requirement for future progress.

Proper correlation of engine adjustment with fuel quality and lubricant properties was shown to be indispensable to efficient operation. L. L. Fawcett of Ponca City, Okla., the Auto Electric Co., told of his development of a system of dynamometer tune-up for engine maintenance, which permits the most intricate adjustments under varying speeds and loads while standing alongside the engine. Many of the adjustments can be made while the engine is running. Air-fuel ratios, carburetor settings and all other adjustments are made in the light of the information developed.

The car or truck is set with the driving wheels resting on and operating two parallel rollers connected to tachometers, a water brake and indicating and recording instruments, the engine acting as the power unit to operate the setup.

Fawcett said he found that air-fuel ratio at medium loads should be set at from 14.5 to 14.8 to 1, which at full load should drop to 13.3 to 1 for the most efficient performance. From tachometer readings in miles per hour and fuel consumption rate shown by a flowmeter, quick determinations of miles per gallon may be made, he stated, and by varying adjustments the best operation can be determined with exactness. Air-fuel ratio and power output tests require less than ten minutes, he said.

Data over a long period of operation of a fleet of more than 400 trucks have shown that company-owned cars may be operated at from three to eight cents per mile, R. J. Collins of the Kansas City Power and Light Co. has found. Truck costs may run as high as 85 cents per mile. His fleet's total operating cost per mile in 1937 was 11 cents, which included direct operating cost of 6.4 cents, maintenance of slightly more than one cent, and fuel cost of about 0.9 cent per mile. Fuel of 70 octane number was used entirely. An oil reclaiming unit reduced lubricating costs materially and has given satisfactory lubrication service, Collins reported.

Application of multi-cylinder engines to drilling and pumping services in the field is increasing, L. W. Johnson, of Stanolind Oil & Gas Co. reported. The installed cost for multi-cylinder engines is averaging about $70 per horsepower, compared to about $80 for the conventional single-cylinder type, he said.

However, builders must consider the special conditions to be met by these engines, in the design of various features. Clutches must be simple and rugged, cooling systems must have ample capacity, be easy to clean, and the use of thermo-syphon systems eliminates trouble by the absence of pumps, gaskets and other accessories which require repair and replacement. Replaceable cylinder liners, valve inserts and special quality valves are necessary for the best and most economical operation, Johnson stated.

Corrosion in Gas Engines

One of the major problems in the field with gas-driven engines in some localities is corrosion from hydrogen sulfide in the gas which runs as high as 12% in some cases, a problem which has not been entirely solved even by chemical treatment of the gas. Another difficulty which operators make for themselves is to buy engines on the basis of average loads rather than to handle efficiently peak loads, which must be carried by an overloaded engine in the former case, it was shown.

In general, mechanical failure is not the bugbear of field operation of automotive and prime mover equipment, these operators say. Rather it is the problems arising from difficulties in replacement and repair, and general service troubles which are controlling factors.

Wearing parts must be replaceable without the shop facilities found in centralized repair shops. Adjustable accessories such as magnetos, carburetors and cooling systems must be simple and capable of adjustment by

MAJOR OIL COMPANIES

Use FRUEHAUF TRAILERS

FOR years, major oil companies throughout the world have chosen Fruehauf Trailers as the most economical, most practical means of transporting petroleum products.

And the same reasoning that has led larger oil companies to adopt Trailers has influenced the choice of the vast number of local operators who have also standardized on Trailers. For Trailer savings are CONSTANT savings—whether you operate one or one hundred, the economy remains pretty much proportionate.

TRAILER SAVINGS

Trailers clicked with the oil industry from the start because they make it possible to haul greater gallonage with smaller, lighter power units. Result: savings in initial cost, savings in operating cost, faster deliveries.

In addition, oil concerns have liked the greater flexibility of the tractor-trailer—have found in its detachability the key to greater profits through the "shuttle" system—using one tractor to operate two or more Trailers.

FRUEHAUF SAVINGS

Major oil companies pick Fruehaufs for their greater "built-in" value. Designed by the Trailer industry's largest engineering staff, Fruehaufs are built to fit individual requirements—are, in each case, as light as safety will allow. In addition, Fruehauf owners have the advantage of knowing that *standard parts are always available*—have the protection of nation-wide service facilities.

Springs are double-shackled, radius rods rubber-mounted and horizontally installed to insure correct axle alignment. Meehanite brake drums reduce the possibility of overheating, make for longer brake life. A special, exclusive lower coupler acts as a universal pivot, frees the Trailer itself from all rocking stresses, thereby adding to the life of the tank. Automatic "Alco" lubricators lubricate spring shackles continuously—need refilling only every 10,000 miles.

★ ★ ★

LET'S TALK IT OVER

IF YOU are not already using Fruehauf Trailers for hauling gasoline, fuel oil, packaged petroleum products, we can help you reduce your haulage costs substantially. Please drop us a line and let us send a factory-trained representative to discuss this important phase of your business with you. No obligation at all.

World's Oldest and Largest Manufacturers of Truck-Trailers

FRUEHAUF TRAILER COMPANY

10918 Harper Avenue - Detroit, Michigan

Sales and Service In Principal Cities

"Engineered Transportation"

REG. U. S. PAT. OFF.

PROFESSIONAL HAULERS USE MORE FRUEHAUF TRAILERS THAN ANY OTHER MAKE

Dr. C. W. Rippie, of St. Louis, Solvay Sales Co., and Dr. R. T. Leslie, Skelly Oil Co.

average field personnel, usually not technical graduates nor even men highly trained in service and maintenance methods.

Diesel Fuel Qualities

Higher efficiency of diesel engines at part loads is one of the factors encouraging their adoption, discussion brought out. Cetane number of diesel fuels higher than 60 is not likely to be required, they say. A cetane number of 50 is considered a good standard for these fuels. If engines are designed to take advantage of the inherent ignition quality of the higher cetane fuels, other problems are encountered which militate against the overall efficiency. Some of the newer designs, such as the new G. M. 2-cycle engine, do not appear to be over-sensitive to fuel ignition quality, a factor which will further encourage use of diesels for automotive and other power applications, it was believed.

The term "extreme pressure lubrication" as has been used for that type of product should really be called "extreme temperature and pressure lubrication," Dr. H. Blok of the Royal Dutch Shell Research Laboratory in Delft, Holland, suggested in a paper presented by T. B. Rendel, associate director of Shell Petroleum Corp.'s automotive research laboratory at Wood River, Ill.

New Lubricant Test

This paper discussed the method developed at Delft for determining the load-carrying capacity of E. P. lubricants, which it is proposed should be called E. T. P. lubricants, by the Four-Ball test, which determines the loading required to cause incipient seizure in the test apparatus within 25 seconds after the test is started.

Three ball bearings are clamped immovably in the bottom of a cup, and are submerged in the lubricant. A high-speed 1.5 hp. motor rotates a fourth ball, clamped in a chuck on a shaft, bringing the ball up to 1450-1500 r.p.m. in a few tenths of a second while the ball is in contact with the three set rigidly in the cup. Load is placed on the set by applying weight to the bottom of the cup which is free to move upward against the chucked ball.

By gradually increasing the load, in a series of test runs, data are obtained to plot a "seizure delay" curve, from which the point of incipient seizure may be determined. No apparent correlation between these results and those from the Timken and SAE machines has been found. It is claimed that closer correlation can be obtained between the Four-Ball test results and hypoid gear test results, although that correlation is not perfect.

Following the practice established three years ago, a debate was held between teams of Kansas State College and the University of Oklahoma, the former taking the affirmative side of the question; "Resolved that rear engine mounting is more desirable than forward engine mounting for passenger cars."

The five judges awarded the decision unanimously to the Oklahoma team supporting the negative position. Preparation of arguments was doubtless the best which has been made in this series of debates, the student debaters showing an excellent grasp of the engineering principles involved in design of engines and cars of the two types. Student memberships in the Society of Automotive Engineers were awarded the competing students.

Jobber's Extra-Profit Item Is Water Softener System

A NEW extra-profit line taken on by the Sweney Gasoline & Oil Co. of Peoria, Ill., is a domestic water softener system. The Sweney company's softener service makes use of a delivery truck and some of the bulk plant warehouse space.

The company has a franchise for the Peoria territory, selling and installing the softening system and servicing the regenerating unit. The bulk plant space is required where the softening material is regenerated by the company itself. The customary operation is for the regeneration to be done in the home, through reversing the flow of water for a stated period to renew the material.

The system marketed by the Sweney company has a small tank hooked into the water line ahead of the heater. The tank contains the softening material held in a muslin bag. At proper intervals a service man calls, shuts off the water for a few minutes, removes the bag of spent softener, and installs a bag with fresh softening material. The spent softening material is returned to the bulk plant, regenerated and is ready for installation on other service calls.

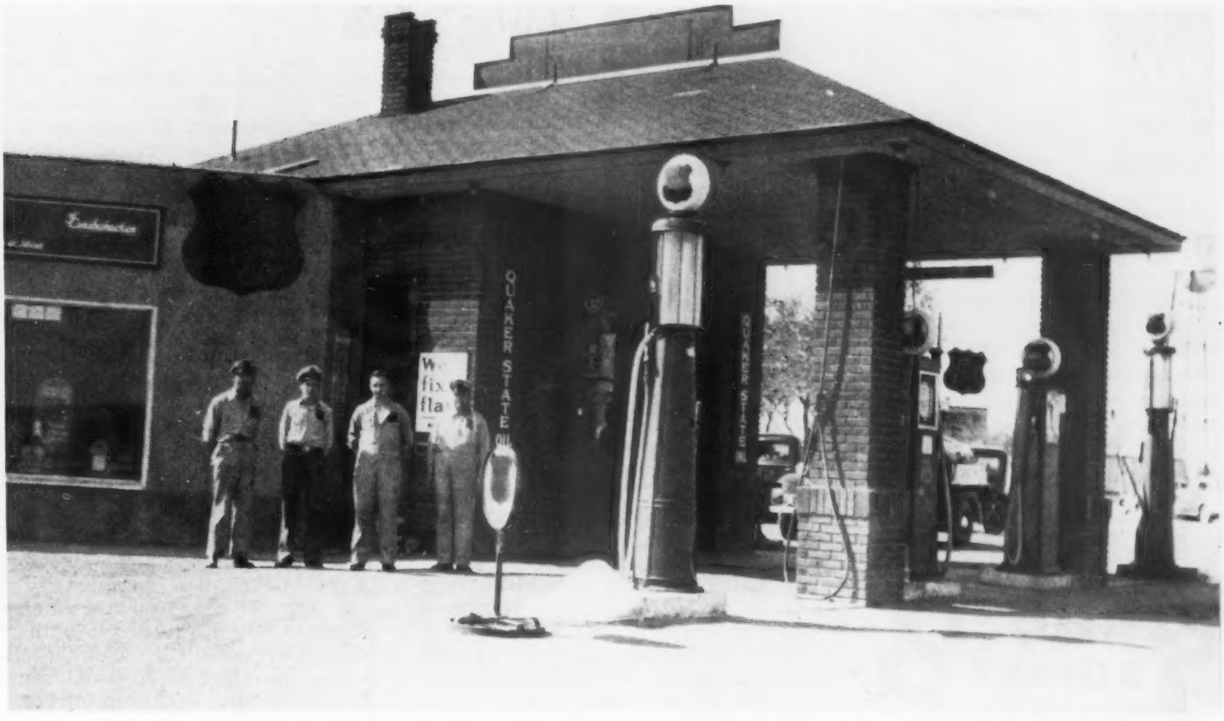
One employe and a panel truck have been placed in the service department. The employe collects the used softening material bags, installs fresh bags, and operates the regenerating unit at the bulk plant. The unit is housed in what was idle space at the bulk plant warehouse so the new department did not require additional bulk plant construction.

The water softening system is sold to home owners, then there is a monthly charge for the service of regenerating the softening material.

The Sweney company began marketing the domestic water softening system in June. For advertising it first depended on word-of-mouth recommendations of users. Newspaper space was used beginning in early August, with a few spot radio announcements. Most of the installations have been in homes, with a few in apartment buildings. Most of the selling so far has been done by those in the company's office.

The softening system was installed in two Sweney stations in Peoria, to advertise the new department and also to attract customers through offering soft water radiator service.

N. P. N. says this is an advertisement but we say it's National Petroleum News



Leo H. Lacey's neat appearing highway service station attracts tourist trade

Selection of Brand Important To Highway Station

MAKES 40% DIFFERENCE

LET Leo H. Lacey, energetic jobber of Sharon Springs, Kansas tell the story in his own words.

"I have been in the gasoline business for the past eleven years and February 18, 1936 I changed to Phillips 66. I sell through the bulk station, my service station and to three dealers. Since I started handling Phillips products our sales have increased about 40%."

There's more to Mr. Lacey's letter and we appreciate his complimentary remarks about Phillips products. But the above excerpt tells the story.

Sharon Springs is a small town in western Kansas, only 792 people. But it is located on the heavily traveled U. S. Highway 40, so that tourist business is an important factor in the success or failure of any Sharon Springs service station.

A 40% increase demonstrates the amazing popularity of Phillips 66. Not only local sales but tourist sales increased sharply, which is just one more indication that loyal Phillips 66 users watch for the orange and black shield wherever they go.

Mr. Lacey operates a cottage court in conjunction with his service station and it only stands to reason that the increased traffic brought in by the Phillips 66 shield must mean more business for the cottage court.

NATIONAL CREDIT CARD

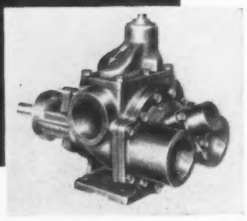
Phillips and seventeen other companies from coast to coast have just arranged a reciprocal credit card plan which will mean still more business to highway stations flying the orange and black shield. Under the terms of the agreement, these seventeen companies guarantee the credit of their credit card holders to all Phillips 66 jobbers and dealers. In effect, these seventeen companies say to their credit customers, "When you are in the Phillips 66 marketing area buy your gasoline at Phillips 66 stations. We have made arrangements so that your credit card is good at all of them." Already this agreement has brought extra gallonage to highway stations. Further you can issue a Phillips 66 National Credit Card to your customers that will be recognized from coast to coast at the stations of these seventeen companies—a convenience they will appreciate.

It's simple to take advantage of these gallonage building features. Let them go to work for you. Write, wire or phone the nearest Phillips Petroleum Company office listed below. There may be a franchise open in your territory.

PHILLIPS PETROLEUM COMPANY
Bartlesville, Oklahoma

Chicago Minneapolis St. Louis
Indianapolis Des Moines Omaha
Peoria Kansas City Wichita
Tulsa Amarillo

THE FUEL OIL PUMP THAT'S 20 FEATURES BETTER



FEATURE NO. 1 The BIGGEST pumping capacity from the LEAST pump weight! A *big* advantage, especially on truck installations. This weight advantage in relation to capacity is the result of more *efficient* operating principles newly developed and exclusively GRANBERG!

SIZES AND CAPACITIES

Inlet & Outlet	Model	Capacity G. P. M.	Speed R. P. M.	Shipping Weights
1½"	D	60	500	43
2"	DEE	91	750	47
2"	EE	120	600	77
3"	H	300	600	171

Granberg ROTARY PUMPS

GRANBERG EQUIPMENT, INC.
4068 Holden Street, Oakland, California
Distributors in All Principal Districts
Write for name and address of one nearest you.

Encourage Customer To Watch "Lube" Job

Eighty-nine out of 100 Sunoco dealers recently interviewed by the company stated that they urged customers to watch the lubrication work being done on their cars, according to the October issue of the Sunoco Diamond. They said this procedure was agreeable to the customer and profitable to the dealer.

Seven of the 100 dealers interviewed said thy did not have sufficient experience to answer honestly and the remaining four said they did not encourage lubrication customers to watch the work being done because it "slowed things up."

Among the statements of the 89 dealers who favor asking customers to watch the "lube" job being performed on their own cars, nine principal reasons were given, summed up thus in the Sunoco Diamond:

"It enables them to demonstrate their lubrication skill and superior workmanship first-hand.

"It gives them an opportunity to sell more accessories—to talk tires, batteries, spark-plugs, fan-belts, etc.

"It helps them build up friendly acquaintanceships and better relations with each customer.

"It brings repeat business because, after a time, customers are made to feel "a part" of the station.

"It gives a dealer an opportunity to educate customers in the value of having lubrications at regular intervals.

"It aids the dealer to capitalize on the various greases he uses—and to show customers just why they are applied at certain places.

"It creates favorable advertising because a customer will talk to his friends about what he has seen the dealer do.

"It avoids any future unpleasantness that may arise in the nature of a complaint because a customer has seen the job with his own eyes.

"Last but certainly not least, it gives the dealer "an edge" over his competitors—and particularly those who are attempting to do cheap lubrication work."

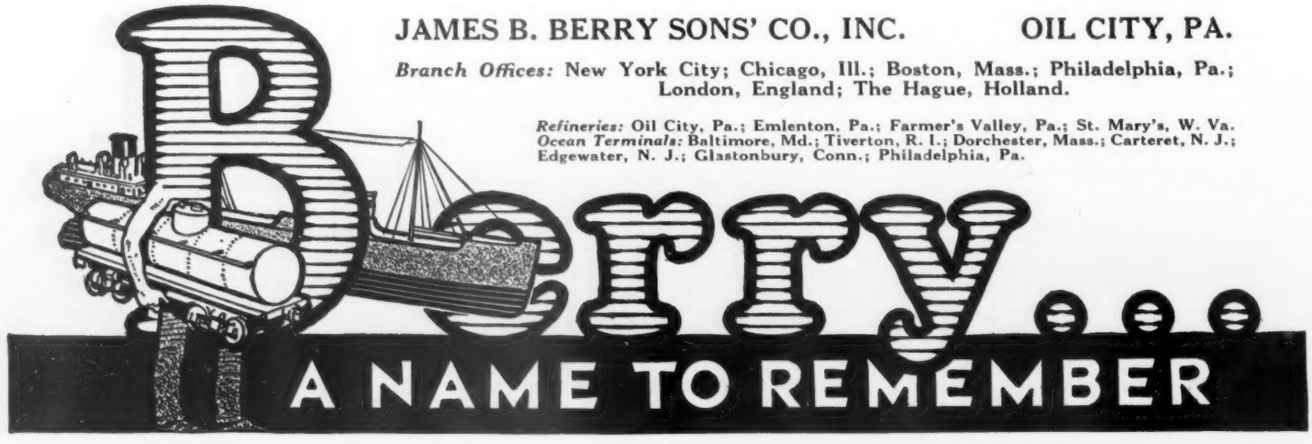
Lubrication Specialists

A. Roy Allison, well known grease salesman, until recently with the Stevens Grease & Oil Co. of Cleveland, is now operating as A. R. Allison and Associates, sales engineers for belt and boiler treatments and for specialized lubrication problems generally, covering the territory east of the Mississippi River. He is continuing his headquarters in Cleveland.

PENNSYLVANIA WINTER OILS . . . .

We are able to offer below zero pour test Pennsylvania Oils of the highest quality. This material can be shipped in one quart, five quart, and two gallon cans as well as drums or tank cars.

At the present, Pennsylvania Oils are quoted at prices far below their lubricating worth, and we believe that it would be decidedly to your advantage to purchase your Fall and Winter requirements at this time.



JAMES B. BERRY SONS' CO., INC. OIL CITY, PA.

Branch Offices: New York City; Chicago, Ill.; Boston, Mass.; Philadelphia, Pa.; London, England; The Hague, Holland.

Refineries: Oil City, Pa.; Emlenton, Pa.; Farmer's Valley, Pa.; St. Mary's, W. Va.
Ocean Terminals: Baltimore, Md.; Tiverton, R. I.; Dorchester, Mass.; Carteret, N. J.; Edgewater, N. J.; Glastonbury, Conn.; Philadelphia, Pa.

TRADEMARKS

The following are trademark applications pertinent to our field pending in the United States Patent Office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Mark Company, Munsey Building, Washington, D. C., trademark specialists.

As an additional service feature to its readers, this journal gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering. You may communicate with the Editor of this Department, or send your inquiry direct to the National Trade-Mark Company, stating that you are a reader of this journal.

Published Sept. 20, 1938

SUNOCO A to Z LUBRICANTS. Ser. No. 407,074. Sun Oil Company, Philadelphia, Pa. Filed June 3, 1938.

For lubricating oils and greases.

UNAFLO, and design. Ser. No. 394,440. Universal Atlas Cement Co., Chicago. Filed June 23, 1937.

For Oil Well Cement.

ESKO. Ser. No. 408,454. L. O. Church Corporation, Peoria, Ill. Filed July 13, 1938.

For permanent anti-freeze solution for use in internal combustion engine cooling systems.

* * *

Pub. Sept. 27, 1938

LUXTRA, Ser. No. 407,770, Societe Commerciale Des Produits du Petrole, Paris, France. Filed June 22, 1938.

For Heavy Lubricating Oil.

Representation of Keystone, Ser. No. 408,953. Keystone Lubricating Co., Philadelphia, Pa. Filed July 27, 1938.

For Telltale or Indicating Lubrication Fittings.

* * *

Published Oct. 4, 1938

BLAZER. Ser. No. 396,756. Ashland Oil & Refining Co., Ashland, Ky. Filed Aug. 26, 1937.

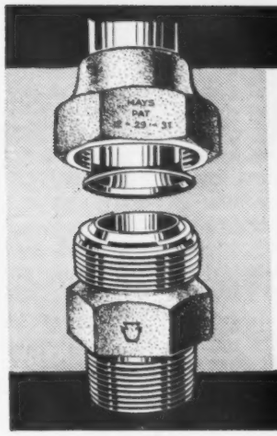
For gasoline.

THRIFTY and picture of a Scotsman. Ser. No. 404,923. Sunset Oil Company, Los Angeles, Calif. Filed April 5, 1938.

For gasoline.

MOBIL. Ser. No. 408,518. Socony-Vacuum Oil Company, Incorporated New York City. Filed July 14, 1938.

For lubricating oils and greases and for petroleum fuel distillates in the nature of gasoline, Diesel-Engine Fuel, Furnace Oils and the like.



WHEREVER *Copper Pipe* GOES

Double Seals GO TOO . . .

From Tank to Pump

Double Seals and Copper pipe from Tank to Pump eliminate expensive swing joints, reduce friction by substituting smooth pipe curves for sharp fitting turns. No litharge or solder, for Double Seals are copper to copper anchored in a bull dog grip that never says "Uncle" to freezing—heaving—settling ground—traffic jar, vibration, or corrosion. Investigate Double Seals on Strength Economy and Long Life. Write for 24 page catalog.

HAYS MFG. CO., ERIE, PA.

THIN-ICE FOLLIES !!

CHECK OVER the successful oil merchandisers in your community, and we doubt if you'll find one who became successful by concentrating on cheap oils.

"Never-mind-the-quality"... "just-as-good"..."price-appeal-is-everything" oils, are the thin ice of the oil business.

The oil man who skates around the edges of this thin ice is undermining his business, and the fellow who concentrates exclusively on "price oils" is in trouble from the start.

There's only one sure and certain way to build up a sound, successful and profitable oil volume, and that is to have a host of satisfied customers who repeat regularly and enthusiastically... and that requires a quality oil...Canfield's Premium Penn.

3-WAY PROTECTION

SUB-ZERO *protection* with instant pumpability and snappy starting.
WARM-UP *protection* that resists all motor friction and pressures.
HIGH-SPEED *protection* withstands searing heat at all driving speeds.

AND WHEN WINTER COMES you can turn the tough starting and temperature conditions into a permanent sales builder, because Premium Penn's 3-Way Winter Protection gives a superior lubrication service that does a wonderful job of winning year-round customers.

No oil merchandiser ever regretted hitching his sales to Premium Penn...mail the coupon for further information.

Canfield

TRIPLE ZONE
Premium Penn
THE 5000 RPM MOTOR OIL

THE CANFIELD OIL CO., CLEVELAND, OHIO
Plants, Coraopolis, Pa., Cleveland, O., Jersey City, N. J.
☐ Send prices on Premium Penn Winter Motor Oils
☐ Winter E. P. Gear and Transmission Lubricants
We buy in ☐ Sealed Cans, ☐ Drums, ☐ Tank Cars
Name_____
Address_____

Markets

Mid-Continent

TULSA, Oct. 17. — Widespread gasoline price recessions were reported last week by Mid-Continent refiners in a market which they said was highly unsettled by crude price cuts and uncertain retail markets. A revival of jobber inquiry was reported, although refiners said few inquiries resulted in orders. Open spot gasoline sales were few, according to reports.

Price ranges for Oklahoma 62 octane and below and 70-72 octane gasolines were narrowed when several refiners on the top of the market reported lowering their quotations. Quotations reported for 62 and below grade still covered a range of 0.875 cent, however—from 3.625 to 4.5 cents and 70-72 octane quotations covered a range of 0.75 cent, from 4.625 to 5.375 cents.

More active inquiry for low vapor pressure natural gasoline was indicated last week. Quotations reported for Grade 26-70 ranged from 2.75 to 3 cents, f.o.b. Breckenridge and f.o.b. Group 3.

A blender reported information indicating quotations for Mid-Continent bright stock and neutral oil were being made at prices 0.5 to 1 cent below prices quoted by suppliers.

Eastern

NEW YORK, Oct. 17. — Wholesale gasoline markets along the eastern seaboard were unaffected by the cuts in crude oil prices in the southwest, according to reports of traders here.

Traders pointed out that boat rates, which in the past several weeks have been on the upgrade have offset so far any decrease in gasoline prices at the Gulf, resulting in about the same prices laid down at eastern ocean plants that had prevailed before the reductions in cargo prices at the Gulf.

Two sellers in the New York harbor market reported advancing their tank car and barge quotations for above 65 octane gasoline 0.25 cent to 6.25 cents and 6 cents, respectively. This grade, however, still was available at 5.75 cents in barge lots, and 6 cents in tank cars up to the end of the week. In fact, an occasional lower-priced offering was heard, although confirmation was lacking.

Pennsylvania

CLEVELAND, Oct. 17. — Prices for 65 octane gasoline and wax were reported lower in western Pennsylvania the past week. Kerosine and lubricating oils were steady and fuel oil tight, reports generally indicated.

One seller reported offering 65 octane gasoline at 6.25 cents for shipment from both the upper and lower districts. This was a 0.5-cent reduction in his upper field price, and a 0.25-cent cut in his lower field price. U. S. Motor quotations generally were reported unchanged.

Sales of 124-126 white crude scale wax were reported at 2.3 cents, New York, down 0.05 cent a pound. Two refiners quoting the 122-124 grade said there was no change in their quotations of 2.35 cents and 2.4 cents.

One refiner reported reducing his quotations for all grades of neutral oil 1 to 1.5 cents a gallon to the levels already being quoted by several other refiners.

Gulf

NEW YORK, Oct. 17. — Trading in most products at the Gulf was virtually at a standstill following widespread crude oil price reductions in southwestern states.

The market was unsettled throughout the week. Reports here indicated that foreign buyers' ideas had been scaled downward following the cut in crude prices.

Gasoline prices were lower late in the week, when one small cargo of 64-66, 375 e.p. gasoline was reported sold to a French buyer for November lifting at 4.5 cents, f.o.b. the Gulf.

High octane gasoline, both for foreign and domestic shipment, also was available at lower prices late in the week, with no sales reported and only nominal interest displayed by purchasers, according to reports here.

Gas oil and kerosine were reported unchanged following the crude reductions.

Mid-Western

CHICAGO, Oct. 17. — Most Chicago tank car marketers reported reducing their quotations 0.125 cent on gasoline to 3.375 cents for 62 octane and below, 4.125 cents for 67-69 octane and 4.25 cents for 70-72 octane following the widespread crude oil price reductions the past week. Unconfirmed reports of price shading on regular grade gasoline were frequently encountered toward the end of the week.

Tank car marketers generally said that jobbers were extremely cautious in making commitments. At the same time many traders said they believed the crude cuts for the most part had already been discounted in prices for refined products. Contract movement of all grades of gasoline was reported active as summer temperatures prevailed throughout the Middle West.

Kerosine offerings were relatively free and no particular buyer interest in this product was reported by Chicago traders.

California

LOS ANGELES, Oct. 15. — Recent feelers in the west coast market for quotations on gasoline, diesel oil and gas oil in cargo lots have failed to produce any actual sales and suppliers were fearful that the business had gone to lower quotations at the Gulf.

Buyers of bunker fuel oil, normally entering the market early in October, were reported adopting a watchful waiting policy with the expectation there would be lower posted prices on this product before the year-end.

In the domestic trade, several independent refiners reported advancing their quotations for unbranded gasolines 0.375 cent to 6.875 cents. Retail prices in the Los Angeles Basin on these products continued within a range of 11.5 to 13 cents.

While no appreciable increase in diesel oil and stove distillate prices was reported, independent suppliers said cooler weather had caused a perceptible strengthening in the face of increased demand.

Fuel Oil

CHICAGO, Oct. 17. — Summer temperatures continued to curtail jobber interest in light fuels appreciably, traders here said the past week. Most grades were reported firm, however, and No. 3 fuel was said to be particularly scarce.

All grades of Michigan light fuel were firm and open market offerings were limited, refiners said.

Heavy fuels continued to drag, according to most Chicago marketers and some Michigan refiners also reported slackened demand for these products. Prices generally were reported unchanged.

* * *

NEW YORK, Oct. 17. — Fuel oil was without outstanding feature in wholesale markets along the eastern seaboard the second week of October.

Occasional unconfirmed reports of No. 2 oil being available in barge lots at under 3.875 cents in the New York harbor market were encountered during the week.

Buying was somewhat brisker in key markets along the seaboard, according to reports of sellers, but volume generally was said to be disappointing. Warm weather in the east has resulted in light consumption.

* * *

TULSA, Oct. 17. — Mild weather hampered movement of Mid-Continent light fuels to northern heating oil distributors. Inter-refinery inquiry continued active, suppliers said. Most trading was in "futures" and against contracts. Quotations for Nos. 1 to 3 oils generally were reported unchanged.

Heavy fuel deliveries to railroads and industrial concerns were slow. Stocks were reported top-heavy and were expected by some observers to discourage any increase in refinery crude runs.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). Prices in cents per gallon except heavy fuel oils in dollars per barrel of 42 gallons, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Natural Gasoline

(Prices to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

Prices Effective	Oct. 17	Oct. 10
F.O.B. GROUP 3		
Grade 26-70	2.75 – 3.00	2.75 – 3.00
F.O.B. BRECKENRIDGE		
Grade 26-70	2.75 – 3.00	2.75 – 3.00
CALIFORNIA (F.o.b. plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	6.50 – 6.75	6.50 – 6.75

Kerosine

WESTERN PENNA.		
Bradford-Warren:		
45 w.w.	5.125– 5.375	5.125– 5.375
46 w.w.	(e) 5.25 –5.375	(e) 5.25 –5.375
Other districts:		
45 w.w.	4.75 – 5.00	4.75 – 5.00
46 w.w.	(h) 5.00 –5.125	(h) 5.00 –5.25
47 w.w.	5.125– 5.25	5.125– 5.375
CENTRAL MICHIGAN (a)		
47-49 w.w.	5.00 – 5.30	5.05 – 5.30
OKLAHOMA		
41-43 w.w.	3.75 – 4.25	3.75 – 4.25
42-44 w.w.	4.00 – 4.625	4.00 – 4.625
KANSAS (For Kansas destinations only).		
41-43 w.w.	(e) 4.375	(e) 4.375
42-44 w.w.	4.50 – 4.625	4.625– 4.75
N. TEX. (b)		
41-43 w.w.	4.25 – 4.50	4.25 – 4.50
N. LA. (For shipment to La. and Ark.)		
41-43 w.w.	4.00 – 4.50	4.00 – 4.50
ARK. (F.o.b. Ark. plant of one refiner, for shipment to Ark. and La.)		
41-43 w.w.	4.50	4.50
CALIFORNIA		
40-43 w.w.	5.00 – 7.00	5.00 – 7.00

Gas *and* Fuel Oils

WESTERN PENNA.		
Bradford-Warren:		
36-40	4.375– 4.50	4.375– 4.50
Other districts: (Excluding Pittsburgh District Prices).		
36-40	4.00	4.00 – 4.25
CENTRAL MICHIGAN (a)		
P.W. Distillate	4.75 – 4.875	4.75 – 5.00
No. 3 gas oil, Str.	4.25 – 4.625	4.25 – 4.625
U.G.I. gas oil	4.00 – 4.375	4.00 – 4.375
Fuel Oils (Vis. at 100):		
500-700 Vis.	2.375– 2.50	2.375– 2.75
300-500 Vis.	2.50 – 3.00	2.50 – 3.00
100-300 Vis.	2.625– 3.25	2.625– 3.25
OKLAHOMA		
No. 1 prime white	3.75 – 4.00	3.75 – 4.00
No. 1 straw	3.625– 3.875	3.625– 3.875
No. 2 straw	3.50 – 3.75	3.50 – 3.75
No. 2 dark	(e) 3.375	(e) 3.375
28-30 fuel oil	(e) 3.25	(e) 3.25
28-30 zero fuel	3.25 – 3.50	3.25 – 3.50
24-26 fuel	(e) $0.925	(e) $0.925
14-16 fuel	(e) $0.70	(e) $0.70
KANSAS (For Kans. destinations only).		
No. 1 p.w. fuel oil	4.00 – 4.125	4.00 – 4.125
10-14 fuel oil	$0.45 –$0.80	$0.45 –$0.80
N. TEX. (b)		
No. 1 Prime white	(e) 4.00	(e) 4.00
N. LA. (For shipment to La. and Ark.)		
20-24 fuel	(e) $1.00–$1.05	(e) $1.00–$1.05
16-20 fuel	(e) $0.80–$0.85	(e) $0.80–$0.85
10-14 fuel	(e) $0.70–$0.75	(e) $0.70–$0.75
ARK. (F.o.b. Ark. plant of one refiner, for shipment to Ark. and La.)		
No. 2 fuel	3.625	3.625
28-30 gas oil, zero	3.375	3.375
Ark. Tractor Fuel	(j) 4.625	(j) 4.625

Prices Effective	Oct. 17	Oct. 10
CALIFORNIA		
San Joaquin Valley:		
Heavy fuel	$0.55 –$0.75	$0.55 –$0.75
Light fuel	$0.70 –$0.85	$0.70 –$0.85
Diesel fuel (per gal.)	3.00 – 4.00	3.00 – 4.00
Stove dist. (per gal.)	3.75 – 6.00	3.75 – 6.00
Los Angeles:		
Heavy fuel	$0.45 –$0.90	$0.45 –$0.90
Light fuel	$0.60 –$1.00	$0.60 –$1.00
Diesel fuel (per gal.)	2.50 – 4.00	2.50 – 4.00
Stove dist. (per gal.)	2.75 – 6.00	2.75 – 6.00
San Francisco:		
Heavy fuel	$0.95	$0.95
Light fuel	$1.05	$1.05
Diesel fuel (per gal.)	4.50	4.50
Stove dist. (per gal.)	6.50	6.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Neutral Oils

WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only.)

Viscous Neutrals No. 3 col. (*Viscosity at 70° F.*)

200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	19.00	19.00 –19.50
10 p.t.	18.00	18.00 –18.50
15 p.t.	17.50	17.50 –18.00
25 p.t.	16.00	16.00 –16.50
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	17.00 –18.00	17.00 –18.50
10 p.t.	16.00 –17.00	16.00 –17.00
15 p.t.	15.00 –16.00	15.00 –16.00
25 p.t.	14.00 –15.00	14.00 –15.00

SOUTH TEXAS

Vis. Color		
Pale Oils: (*Vis. at 100°F.*)		
100 No. 1½-2½	4.75 – 5.25	5.00 – 5.25
200 No. 2-3	6.25	6.25
300 No. 2-3	6.75	6.75
500 No. 2½-3½	7.75	7.75
750 No. 3-4	8.25	8.25
1200 No. 3-4	8.75	8.75
2000 No. 4	9.00 – 9.25	9.00 – 9.25
Red Oils:		
200 No. 5-6	6.25	6.25
300 No. 5-6	6.75	6.75
500 No. 5-6	7.75	7.75
750 No. 5-6	8.25	8.25
1200 No. 5-6	8.75	8.75
2000 No. 5-6	9.00 – 9.25	9.00 – 9.25

Note: Red oil prices cover oils with green cast; blue cast red oils are slightly lower in some cases.

MID-CONTINENT (Vis. at 100° F.; F.o.b. Tulsa basis).

Pale Oils: (0 to 10 P.P.) Vis. Color		
60-85—No. 2	5.50	5.50
86-110—No. 2	6.00	6.00
150—No. 3	9.00	9.00
180—No. 3	9.50 –10.00	9.50 –10.00
200—No. 3	10.00 –10.50	10.00 –10.50
250—No. 3	11.00 –11.50	11.00 –11.50
280—No. 3	12.50	12.50
300—No. 3	13.00	13.00
Red Oils:		
180—No. 5	(e) 9.00	(e) 9.00
200—No. 5	9.00 –10.00	9.00 –10.00
280—No. 5	11.50 –11.75	11.50 –11.75
300—No. 5	(e) 12.00	(e) 12.00

Note: The following oils, of 15 to 25 p.p., are generally quoted these amounts under 0-10 p.p.; viscous oils, 0.5c; non-viscous, 0.25c. Viscous oils (150-300 vis.), No. 4 color, generally are quoted 0.5c above No. 5 color oils.

CHICAGO (Vis. at 100° F.)

Pale Oils 0 to 10 p.p.: Vis. Color		
60-85—No. 2	7.25	7.25
86-110—No. 2	7.75	7.75
150—No. 3	10.00	10.00
180—No. 3	11.00	11.00
200—No. 3	11.50	11.50
250—No. 3	12.50	12.50

Prices Effective	Oct. 17	Oct. 10
CHICAGO (Continued)		
Red Oils:		
180—No. 5	10.00	10.00
200—No. 5	10.50	10.50
250—No. 5	11.50	11.50
280—No. 5	12.50	12.50
300—No. 5	12.75	12.75

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower; 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., 0.25c lower. To obtain delivered prices in Chicago, add 0.25c per gal.

Cylinder Stocks

MID-CONTINENT (F.o.b. Tulsa basis)		
Bright Stocks:		
190-200 Vis. at 210 °D.	(e) 19.00	(e) 19.00
150-160 Vis. at 210°D:		
0 to 10 p.p.	14.25 –16.00	14.25 –16.00
10 to 25 p.p.	13.50 –15.50	13.50 –15.50
25 to 40 p.p.	13.50 –15.00	13.50 –15.00
150-160 vis. at 210° E.	12.50 –15.00	12.50 –15.00
120 Vis. at 210° D		
0 to 10 p.p.	14.50 –15.125	14.50 –15.125
25 to 40 p.p.	(e) 14.25	(e) 14.25
600 S.R. Dark Green	5.00 – 7.50	5.00 – 7.50
600 S.R. Olive Green	6.50 – 7.50	6.50 – 7.50
631 S.R.	(e) 12.50	(e) 12.50
Black Oil	3.50 – 4.00	3.50 – 4.00
CHICAGO (Viscosity at 210°)		
Unfiltered Steam Refined:		
140	9.00	9.00
160	10.00	10.00
200	11.00	11.00
Bright stocks, 160 vis. at 210. No. 8 color:		
0 to 10 p.p.	15.75	15.75
15 to 25 p.p.	14.75	14.75
30 to 40 p.p.	14.25	14.25
E filtered Cyl. Stock	13.50	13.50

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only.)

600 S.R. filterable	8.00	8.00
650 S.R.	10.00 –10.50	10.00 –10.50
600 fl	10.50 –11.50	10.50 –11.50
630 fl	13.00	13.00
Bright stock, 145-155 vis. at 210°, 540-550 flash, No. 8 color:		
10 p.t.	17.00	17.00
15 p.t.	16.00	(h) 16.00
25 p.t.	14.00 –14.50	14.00 –14.50

Petrolatums

WESTERN PENNA. (In bbls., carloads; in tank cars, 0.5c less)		
Snow White	5.875	6.125
Lily White	4.875	5.125
Cream White	3.875	4.125
Light Amber	2.50	2.50 – 2.625
Amber	2.25	2.25 – 2.375
Red	1.875– 2.00	2.00

Wax

WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only. In bbls., carloads, New York)		
122-124 A.m.p., w.c. scale	(h) 2.35	(h) 2.35 –2.40
124-126 A.m.p., w.c. scale	2.30 – 2.35	2.35 – 2.40
OKLAHOMA (In bbls. or burlap bags, carloads)		
124-126 A.m.p., w.c. scale	2.35	2.35
CHICAGO (In bags, carload lots. Melting points are E.M.P. (A.S.T.M.) methods; add 3° F. to convert into A.m.p.)		
Fully refined:		
122-124	4.00	4.00
125-127	(i) 4.10	(i) 4.10
127-129	(i) 4.45	(i) 4.45
130-132	(i) 4.75	(i) 4.75
132-134	(i) 5.00	(i) 5.00
135-137	(i) 5.75	(i) 5.75

(a) Prices f.o.b. Central Michigan refinery group basis, for shipment within Mich. Shipments may originate at plants outside Central group. (b) For shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments. (c) Excluding Detroit shipment. (d) Nominal. (e) One refiner quoting. (f) No price reported. (g) To resellers holding licenses. (h) Two refiners quoting. (i) Same prices quoted in bags or slabs loose. (j) For shipment to Ark. points only.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days) unless otherwise stated. Prices in cents per gallon, except heavy fuel oils in dollars per barrel of 42 gallons, wax and petrolatums in cents per pound in barrels, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Gasoline

Prices Effective	Oct. 17	Oct. 10
OKLAHOMA		
U. S. Motor: (Octane L-3)		
62 oct. & below	3.625- 4.50	3.75 - 4.875
63-66 oct.	4.125- 4.50	4.125- 4.50
67-69 oct.	4.375- 4.875	4.375- 4.875
70-72 oct.	4.625- 5.375	4.625- 5.625
60-62, 400 e.p.	4.00 - 4.25	(e)4.25
WESTERN PENNA.		
Bradford-Warren:		
Motor gasoline:		
U. S. Motor (58-62°)	5.25	5.25
Min. 65 oct.	6.25 - 7.00	6.75 - 7.25
Min. 70 oct.	(e)7.25	(e)7.25
"Q" gasoline	(e&g)7.00	(e&g)7.00
Other districts:		
Motor gasoline:		
U. S. Motor (58-62°)	5.00	5.00
Min. 65 oct.	6.25 - 6.75	6.50 - 6.75
"Q" gasoline	(g) 6.75 -7.00	(g) 6.75 -7.00

Prices Effective	Oct. 17	Oct. 10
CENTRAL MICHIGAN (a)		
Str.-Run Gasoline	(c) 4.50 -5.25	(c) 4.75 -5.25
U. S. Motor: (Octane L-3)		
67-69 octane	(e)7.50	(e)7.50
70-72 octane	8.00 - 8.125	8.00 - 8.125
CALIFORNIA (3c tax to be added if used in state)		
U. S. Motor:		
54-58, for instate shipment	6.50 - 9.25	6.75 - 9.25
54-58, for outside state shipment	6.75 - 9.00	6.75 - 9.00
58-61, 375-400 e.p., 65 oct. & above	7.75 - 9.75	7.75 - 9.75
N. TEX. (b)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.25 - 4.50	4.25 - 4.75
63-66 oct.	4.50 - 5.00	4.50 - 5.25
67-69 oct.	4.75 - 5.00	4.75 - 5.125
70-72 oct.	5.125- 5.375	5.125- 5.375
60-62, 400 e.p.	4.25	4.25
KANSAS (For Kansas destinations only)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.125- 4.75	4.25 - 4.75
70-72 oct.	5.00 - 5.50	5.125- 5.50

Prices Effective	Oct. 17	Oct. 10
W. TEX. (b)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.125- 4.50	4.125- 4.50
63 66 oct.	4.50 - 4.75	4.50 - 5.125
67 69 oct.	4.75 - 5.125	4.75 - 5.25
70 72 oct.	5.00 - 5.50	5.00 - 5.75
E. TEX.		
60 62, 400 e.p.	4.50	4.50
N. LA. (For shipment to La. & Ark.)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.375- 4.75	4.375- 4.75
63 66 oct.	(e 4.625	(e)4.625
67 69 oct.	(e 4.875	(e)4.875
70 72 oct.	5.50	5.50
ARKANSAS (F.o.b. Ark. plant of one refiner, for shipment to Ark. & La.)		
U. S. Motor: (Octane L-3)		
62 octane & below	4.50	4.50
67 69 oct.	5.125	5.125
OHIO (Quotations of S. O. Ohio. Delivered anywhere in Ohio).		
U. S. Motor	7.375	7.375
Above 65 oct.	7.625	7.625

(Continued on next page)

(a) Prices f.o.b. Central Michigan refinery group basis, for shipment within Mich. Shipments may originate at plants outside Central group. (b) For shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments. (c) Excluding Detroit shipment. (d) Nominal. (e) One refiner quoting. (f) No price reported. (g) To reseller s holding licenses. (h) Two refiners quoting.

MID-WESTERN TANK CAR MARKET

Prices in this Midwestern Tank Car Market table are gathered from refiners and tank car marketers or brokers from their offices located in Chicago and the surrounding territory. While the prices are quoted on a Group 3 (Oklahoma) freight rate basis, this is in accordance with the custom of the oil industry which uses Group 3 as a price basis for the ease of comparing prices even when the material originates in another refining district. Generally when prices are quoted in this Chicago market, the origin of the material is not known at the time the quotation is given, oftentimes even with the quoting refiners who have refineries in more than one refining district. All other gasoline prices are given by and for the particular refining district where the material is made and from which it is shipped.

Gasoline

Prices Effective	Oct. 17	Oct. 10
U. S. Motor: (Octane L-3)		
62 oct. and below	3.375- 4.375	3.50 - 4.375
63-66 oct.	4.00 - 4.875	4.00 - 4.875
67-69 oct.	4.125- 5.00	4.25 - 5.00
70-72 oct.	4.25 - 5.125	4.375- 5.125

Kerosine

41-43 w.w.	3.75 - 4.25	3.75 - 4.25
42-44 w.w.	3.75 - 4.375	3.75 - 4.375

(a) Nominal.

Fuel and Gas Oils

Prices Effective	Oct. 17	Oct. 10
No. 1 p.w.	3.625- 3.875	3.625- 3.875
No. 1 straw	3.625- 3.75	3.625- 3.75
No. 2 straw	3.50 - 3.625	3.50 - 3.625
No. 3	3.25 - 3.50	3.25 - 3.50
No. 5	(a) $0.60-$0.70	(a) $0.60-$0.70

Prices Effective	Oct. 17	Oct. 10
No. 6	(a) $0.35-$0.50	(a) $0.35-$0.50
U. G. I. gas oil	(a) 2.875 3.00	(a) 2.875 3.00
Range oil	3.75 - 4.00	3.75 - 4.00

Naphtha and Solvent

Stoddard solvent	5.875	5.875
Cleaners' naphtha	6.375	6.375
V. M. & P. naphtha	6.375	6.375
Mineral spirits	5.375	5.375
Rubber solvent	6.375	6.375
Lacquer diluent	7.375	7.375

Daily range of gasoline prices as reported in PLATT'S OILGRAM (Week Ended Oct. 14, 1938)

U. S. Motor, (Octane Number determined according to L-3 Method in Okla., Texas and Mid-Western Districts):	Oct. 10	Oct. 11	Oct. 12	Oct. 13	Oct. 14
62 octane and below:					
Oklahoma	3.75 - 4.875	3.75 - 4.875	3.75 - 4.75	3.75 - 4.50	3.625- 4.50
(b) North Texas	4.25 - 4.75	4.25 - 4.75	4.25 - 4.75	4.25 - 4.75	4.25 - 4.75
West Texas	4.125- 4.50	4.125- 4.50	4.125- 4.50	4.125- 4.50	4.125- 4.50
Mid-Western (Group 3 basis)	3.50 - 4.375	3.50 - 4.375	3.50 - 4.375	3.50 - 4.375	3.375- 4.375
63-66 octane:					
Oklahoma	4.125- 4.50	4.125- 4.50	4.125- 4.50	4.125- 4.50	4.125- 4.50
(b)North Texas	4.50 - 5.25	4.50 - 5.25	4.50 - 5.25	4.50 - 5.25	4.50 - 5.25
West Texas	4.50 - 5.125	4.50 - 5.25	4.50 - 5.125	4.50 - 4.75	4.50 - 4.75
Mid-Western (Group 3 basis)	4.00 - 4.875	4.00 - 4.875	4.00 - 4.875	4.00 - 4.875	4.00 - 4.875
67-69 octane:					
Oklahoma	4.375- 4.875	4.375- 4.875	4.375- 4.875	4.375- 4.875	4.375- 4.875
(b)North Texas	4.75 - 5.125	4.75 - 5.125	4.75 - 5.125	4.75 - 5.125	4.75 - 5.125
West Texas	4.75 - 5.25	4.75 - 5.25	4.75 - 5.25	4.75 - 5.125	4.75 - 5.125
Mid-Western (Group 3 basis)	4.25 - 5.00	4.25 - 5.00	4.25 - 5.00	4.125- 5.00	4.125- 5.00
70-72 octane:					
Oklahoma	4.625- 5.625	4.625- 5.625	4.625- 5.50	4.625- 5.375	4.625- 5.375
(b)North Texas	5.125- 5.375	5.125- 5.375	5.125- 5.375	5.125- 5.375	5.125- 5.375
West Texas	5.00 - 5.75	5.125- 5.375	5.00 - 5.75	5.00 - 5.50	5.00 - 5.50
Mid-Western (Group 3 basis)	4.375- 5.125	4.375- 5.125	4.375- 5.125	4.25 - 5.125	4.25 - 5.125
Motor Gasoline, 60-64 octane:					
New York harbor	(a) 6.00- 6.75	(a) 6.00- 6.75	(a) 6.00- 6.75	(a) 6.00- 6.75	(a) 6.00- 6.75
Philadelphia district	(a) 6.00- 6.50	(a) 6.00- 6.50	(a) 6.00- 6.50	(a) 6.00- 6.50	(a) 6.00- 6.50
Baltimore district	(a) 6.00- 6.50	(a) 6.00- 6.50	(a) 6.00- 6.50	(a) 6.00- 6.50	(a) 6.00- 6.50
Motor Gasoline, 65 octane & above:					
New York harbor	(a) 6.00- 6.75	(a) 6.00- 6.75	(a) 6.00- 6.75	(a) 6.00- 6.75	(a) 6.00- 6.75
Philadelphia district	6.25- 6.50	(a) 6.25- 6.50	(a) 6.25- 6.50	(a) 6.25- 6.50	(a) 6.25- 6.50
Baltimore district	6.25- 6.50	(a) 6.25- 6.50	(a) 6.25- 6.50	(a) 6.25- 6.50	(a) 6.25- 6.50
U. S. Motor, 58-62°:					
Bradford-Warren (Western Penna.)	5.25	5.25	5.25	5.25	5.25
Other districts (Western Penna.)	5.00	5.00	5.00	5.00	5.00
Motor Gasoline, Min. 65 octane:					
Bradford-Warren (Western Penna.)	6.75 - 7.25	6.75 - 7.25	6.25- 7.25	6.25 - 7.25	6.25 - 7.25
Other districts (Western Penna.)	6.50 - 6.75	6.50 - 6.75	6.50 - 6.75	6.25 - 6.75	6.25 - 6.75
Motor Gasoline, Min. 70 octane:					
Bradford-Warren (Western Penna.)	(c)7.25	(c)7.25	(c)7.25	(c)7.25	(c)7.25
"Q" Gasoline:					
Bradford-Warren (Western Penna.)	(c&d)7.00	(c&d)7.00	(c&d)7.00	(c&d)7.00	(c&d)7.00
Other Districts (Western Penna.)	(d) 6.75- 7.00	(d) 6.75- 7.00	(d) 6.75- 7.00	(d) 6.75- 7.00	(d) 6.75- 7.00

(a) Nominal. (b) For shipment to Texas and New Mexico destinations: Group 3 prices are quoted on northern shipment. (c) One refiner quoting. (d) To resellers holding licenses.

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GENERAL OFFICES - - - FINDLAY, OHIO

ROBINSON, ILLINOIS TULSA, OKLAHOMA FT. WORTH, TEXAS

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect Oct. 17, 1938, as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

S. O. New Jersey

Essolene
(Regular Grade)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
*Atlantic City, N. J.	6 9	8.9	4	8
*Newark, N. J.	6 9	8 9	4	8
Annapolis, Md	7.85	9.35	5	9.5
Baltimore, Md	7.25	8.75	5	9
Cumberland, Md	8.65	11.15	5	10
Washington, D. C.	7.5	9	3	9.5
Danville, Va.	8.45	10.95	6	12.9
Norfolk, Va.	7.25	9.75	6	11.5
Petersburg, Va.	7.55	10.05	6	11.7
Richmond, Va.	7.55	10.05	6	11.7
Roanoke, Va.	8.75	11.25	6	12.9
Charleston, W. Va.	8.05	10.55	6	12.6
Parkersburg, W. Va.	7.35	9.35	6	11.2
Wheeling, W. Va.	8.35	10.25	6	12.2
Charlotte, N. C.	8.65	11.15	7	12.1
Hickory, N. C.	9.15	11.65	7	12.5
Mt. Airy, N. C.	8.95	11.45	7	12.3
Raleigh, N. C.	8.25	10.75	7	11.6
Salisbury, N. C.	8.75	11.25	7	12.2
Charleston, S. C.	7.25	9.75	7	10.6
Columbia, S. C.	8.25	10.75	7	11.6
Spartanburg, S. C.	8.95	11.45	7	12.4

Discount to undivided dealers, except in Atlantic City and Newark, N. J., which see in "Note" below: Dealer t.w. price less 0.5c per gal.

*Effective Sept. 26, 1938, S. O. New Jersey posted a minimum retail resale price of 11.4c thru New Jersey, except Trenton area and Cumberland county.

Note: While the above posted prices continue at Atlantic City and Newark, N. J., dealers will pay a net price of 8.4c per gal. for Essolene. Dealers having pumps marked only Esso, Essolene and "Standard" White gasoline will pay 7.9c per gal. for Essolene.

Price basis to commercial consumers: To contract accounts, purchasing at least one full compartment at a time by hose connection: Effective March 12, 1937, in New Jersey, and March 8 in Maryland, District of Columbia, and in Arlington and Fairfax Counties in Virginia, on yearly purchases: from 2,500 to 100,000 gals., consumer t.w. price at time and place of delivery; 100,000 gals. per year consumer tank car price, plus 0.5c per gal. Generally consumer t.w. price in foregoing states is equivalent of dealer t.w. price, less 0.5c per gal.

Effective May 15, 1937, on Essolene and Esso (by tank wagon) in North and South Carolina, West Virginia and Virginia (except Arlington and Fairfax Counties, which see above), commercial consumers taking deliveries of 50 gals. (West Va. 100 gals.) or more at one time will be billed at the posted consumer t.w. price. Deliveries less than 50 gals. (West Va. 100 gals.) will be billed at 4c per gal. over posted consumer t.w. price. Generally, posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Kerosine Discount: 1c off t.w. price for 25 gals., or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(S. O. New York Division)

Socony Mobilgas
(Regular Grade)

	Consumer Tank Car	"Split" Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Metropolitan N. Y. City:				
Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	7.25	8.9	*5	8
Borough of Richmond (Staten Is.)	7.25	8.9	*5	8
Albany, N. Y.	7.3	9.3	5	8
Binghamton, N. Y.	8.5	10	5	9
Buffalo, N. Y.	7.6	8.6	5	8
Jamestown, N. Y.	7.8	9.8	5	8.25
Plattsburg, N. Y.	7.8	9.8	5	9.5
Rochester, N. Y.	8.2	9	5	8.5
Syracuse, N. Y.	7.9	9	5	9
Danbury, Conn.	7.6	9.6	4	9
Hartford, Conn.	7.4	9	4	7
New Haven, Conn.	7.3	9.3	4	6
Bangor, Me.	7.75	9.5	5	9
Portland, Me.	7.25	9	5	8.75
Boston, Mass.	7	8.5	4	7.5
Concord, N. H.	8.1	9.7	5	9
Lancaster, N. H.	9	11.2	5	10.25
Manchester, N. H.	7.8	9.5	5	8.5
Providence, R. I.	7	8.5	4	7.5
Burlington, Vt.	7.65	9.7	5	9.5
Rutland, Vt.	8	10	5	9

*Plus 2% city sales tax computed at time of each sale.

Discount to undivided dealers: 0.5c less than "split" dealer t.w.

Price basis to commercial consumers: Effective about Nov. 15, 1936 in New York and New England for tank wagon delivery: monthly purchases of 25,000 gals. or over, pay consumer tank car price at point of delivery, plus 0.5c gal.; monthly purchases of 5,000 to 25,000 gals., pay undivided dealer tank wagon price at point of delivery; monthly purchases of less than 5,000 gals., pay divided dealer tank wagon price at point of delivery. Private consumers pay undivided dealer tank wagon price at point of delivery, plus 2c gal.

Atlantic Refining

Atlantic White Flash Gasoline
(Regular Grade)

	Commercial Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Philadelphia, Pa.	7	8	5	10
Pittsburgh	8	10	5	10.5
Allentown	7.5	9	5	10.5
Erie	8	9	5	10
Scranton	7.5	9	5	10.5
Altoona	8	10	5	10.5
Harrisburg	7.5	9	5	10.5
Williamsport	7.5	9	5	10.5
Dover, Del.	...	7.5	5	10.5
Wilmington	...	8.5	5	9.75
Boston, Mass.	...	8.5	4	8
Springfield, Mass.	...	9	4	8
Worcester, Mass.	...	9	4	8
Fall River, Mass.	...	8.5	4	8
Hartford, Conn.	...	9	4	7
New Haven, Conn.	...	9.3	4	7
Providence, R. I.	...	8.5	4	8
Atlantic City, N. J.	...	8.4	4	8
Camden, N. J.	...	7.7	4	8
Trenton, N. J.	...	8.2	4	8
Annapolis, Md	...	9.35	5	9.5
Baltimore, Md	...	8.75	5	9
Hagerstown, Md.	...	9.85	5	10
Richmond, Va.	...	10.05	6	11.7
Wilmington, N. C.	...	9.85	7	10.8
Brunswick, Ga.	...	9	7	*11.5
Jacksonville, Fla.	...	9	8	10

*Georgia has kerosine tax of 1c per gal., not included in above price.

Discount to undivided dealers: Dealer t.w. less 0.5c per gal. except in Georgia and Florida, dealer t.w. and undivided dealer price is same.

Price basis to commercial consumers: consumers under contract, in Penna. and Delaware, effective Mar. 11, 1937, on yearly gasoline purchases taking full compartment hose deliveries, using 100,000 gals. or more per year, tank car price plus 0.5c per gal.; consumers taking less than 100,000 gals., undivided dealer price. Consumers under contract and not under contract, taking less than full compartment delivery, and consumers not under contract taking full compartment delivery, get divided dealer price. Consumers taking less than 25 gals., t.w. delivery, get 4c above undivided dealer price.

Discount on kerosine: Effective Oct. 29, 1936, in Pennsylvania and Delaware, 2c per gal. off t.w. price on t.w. deliveries of 25 gals. or more at one time.

S. O. Ohio

Sohio X-70 Gasoline
(Regular Grade)

	Consumer T.W.	†Divided Dlr.	Gasoline Taxes	Kerosine T.W.
Ohio Statewide	11	10	5	*12
Counties where some prices are below statewide:				
Butler, Clark, Clinton, Columbiana, Defiance, Greene, Pickaway, Preble and Warren:	10.5	9.5	5	....
Fairfield, Franklin, Montgomery and Paulding:	10	9	5	....
Hamilton	11	9	5	....
Knox	10.5	9	5	....

Renown Gasoline
(Third Grade)

Ohio Statewide	10.5	9.5	5	....
Counties where some prices are off statewide:				
Clark, Columbiana, Defiance, Montgomery and Pickaway	10	9	5	....
Clermont, Darke, and Miami:	11	9.5	5	....
Fairfield, Franklin and Paulding:	9.5	8.5	5	....
Hamilton	11	9	5	....
Knox	10	8.5	5	....

S. O. Ohio Cont'd

Kerosine Prices

(Off Statewide Level)

Kerosine prices are off statewide level in the following counties:

Allen, Auglaize, Champaign, Columbiana, Darke, Geauga, Greene, Hardin, Logan, Mahoning, Mercer, Preble, Putnam, Shelby, Trumbull and Van Wert *11.5
Paulding *11
Ashtabula *10.5
Fayette, Madison, Pickaway, Portage and Summit *8.5

†This price also to authorized agents, exclusive of 0.5c rental. Discount to undivided dealers: 0.5c less than divided dealer t.w.

*Ohio has kerosine tax of 1c per gal., not included in above prices.

Commercial Tank Wagon Q.D.A. to contract accounts: Effective Oct. 20, 1937, thru Ohio (except in 33 counties), on monthly purchases, off posted consumer t.w. price: 0 to 999 gals., 0.5c; 1,000 to 19,999 gals., 1.5c; 20,000 gals. and over, 2.5c. The 30 counties where Q.D.A. differs from statewide are: Allen, Ashtabula, Auglaize, Butler, Champaign, Columbiana, Cuyahoga, Darke, Defiance, Erie, Fulton, Geauga, Hamilton, Hancock, Hardin, Henry, Highland, Logan, Lorain, Lucas, Mahoning, Mercer, Ottawa, Paulding, Putnam, Sandusky, Scioto, Shelby, Trumbull, Van Wert, Williams and Wood.

Sales tax: Ohio's 3% sales tax, effective Jan. 27, 1935, is added "where assessable, to regular posted prices," S. O. Ohio says.

On kerosine, prices to resellers and commercial consumers are posted generally at 3c per gal. below consumer t.w. price in any quantity, when such prices are on statewide level.

S. O. Kentucky

Crown Gasoline
(Regular Grade)

	Consumer T.W.	Net Dlr.	Gasoline Taxes	Kerosine T.W.
Covington, Ky.	12	9	6	10.5
Lexington, Ky.	13.5	10.5	6	10.5
Louisville, Ky.	12	9	6	10
Paducah, Ky.	12	9	6	10
Jackson, Miss.	12.5	9.5	7	*9.5
Vicksburg, Miss.	13	10	7	*9
Birmingham, Ala.	13.5	10.5	*8	10
Mobile, Ala.	12.5	9.5	*9	9
Montgomery, Ala.	12.5	10.5	*9	*9
Atlanta, Ga.	12	9	7	*9
Augusta, Ga.	12.5	9.5	7	*7
Macon, Ga.	12.5	9.5	7	*10.5
Savannah, Ga.	11	8	7	*9
Jacksonville, Fla.	10	7	8	8
Miami, Fla.	12.5	9.5	8	9
Pensacola, Fla.	12	9	*9	10
Tampa, Fla.	10	7	8	8.5

Kyso Gasoline
(Third Grade)

Covington, Ky.	10.5	8	6	....
Lexington, Ky.	12	9.5	6	....
Louisville, Ky.	10	7.5	6	....
Paducah, Ky.	10.5	8	6	....
Jackson, Miss.	10.5	8	7	....
Vicksburg, Miss.	11.5	9	7	....
Birmingham, Ala.	11.5	9	*8	....
Mobile, Ala.	10.5	8	*9	....
Montgomery, Ala.	11.5	9	*9	....
Atlanta, Ga.	8.5	6	7	....
Augusta, Ga.	11	8.5	7	....
Macon, Ga.	11	8.5	7	....
Savannah, Ga.	9.5	7	7	....
Jacksonville, Fla.	9.5	7	8	....
Pensacola, Fla.	10.5	8	*9	....
Tampa, Fla.	9.5	7	8	....

Discounts to all tank wagon consumers: Effective Jan. 4, 1937, thru territory, on Crown gasoline, 3c per gal. below consumer t.w. price; on Kyso, 2.5c below, regardless of quantity purchased, per month

**Taxes:* In the tax column is included these city and county gasoline taxes at the following points: Mobile, 2c city; Birmingham, 1c city; Montgomery 1c city and 1c county; Pensacola, 1c city. Georgia and Montgomery, Ala. have kerosine taxes of 1c per gal., and Mississippi 0.5c, not included in above prices.

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:
Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/5c per gal. in lots up to 25 bbls.; 2/25c per gal. in lots of 25 bbls. or more; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. lots of more than 50 in bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c; and Wisconsin, 3/100c on gasoline, 1/25c on kerosine.
Kerosine inspection fee only: Iowa, 3/50c; Michigan, 1/5c per gal.

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Warren, Pa.

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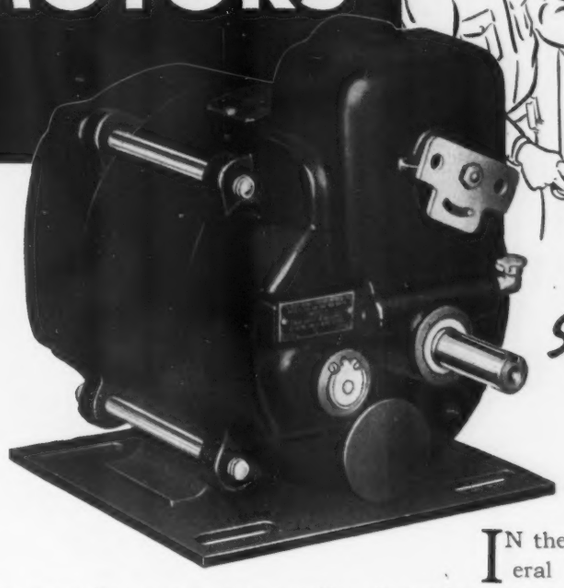

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TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline do not include taxes; they do, however, include inspection fees as shown in general footnote. Gasoline taxes shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect Oct. 17, 1938, as posted by principal marketing companies at their headquarters offices, but subject to later correction.

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Dealer Prices				
	Red Crown Cons. T.W.	Red Crown T.W.	Stano-lind T.W.	Gaso-line Taxes	Kero-sine T.W.
Chicago, Ill.	11.1	9.1	6.4	4	10
Decatur, Ill.	11.1	9.6	8	4	10
Joliet, Ill.	11.1	9.6	8.4	4	10
Peoria, Ill.	11.1	9.6	9.1	4	10
Quincy, Ill.	10.9	8.9	8	4	9.8
Indianapolis, Ind.	11.8	10.3	8.9	5	*9.5
Evansville, Ind.	11.6	10.1	9.1	5	*10.5
South Bend, Ind.	12.1	10.6	9.2	5	*9
Detroit, Mich.	10.3	8.8	7.5	4	9
Grand Rapids, Mich.	10.8	9.5	8	4	9.7
Saginaw, Mich.	11.8	10.3	9.3	4	9.3
Green Bay, Wis.	11.9	10.4	9.9	5	10.3
Milwaukee, Wis.	11.3	9.8	9.3	5	10.2
La Crosse, Wis.	11.5	10	9.5	5	10.4
Minneapolis-St. Paul	11.5	10	9.5	5	10.4
Duluth, Minn.	11.9	10.4	9.9	5	10.8
Mankato, Minn.	11.5	10	9.5	5	10.4
Des Moines, Ia.	10.9	9.4	7.5	4	*9.8
Davenport, Ia.	11.1	9.6	9.1	4	*10
Mason City, Ia.	11.3	9.8	9.3	4	*10.2
St. Louis, Mo.	10.7	9.2	7.5	*4	9.6
Kansas City, Mo.	10.4	8.9	6.9	*4	7.5
St. Joseph, Mo.	10.4	8.9	8.4	*4	9.3
Fargo, N. D.	12.7	11.2	10.7	4	11.6
Minot, N. D.	14	12.5	12	4	12.9
Huron, S. D.	12	10.5	10	5	10.9
Wichita, Kans.	9.9	6.6	5.5	4	7.8

*Taxes: in the tax column is included these city and state gasoline taxes at following points: Kansas City, St. Joseph and St. Louis, 1c city tax. Kerosine taxes: Indiana has 4c, Iowa 3c per gal. state tax, not included in above prices.

Discount to commercial consumers: Effective Jan. 1, 1935, thru territory, except Michigan effective Feb. 1, on purchases per month, discount off t.w. prices; all gasolines, 25 to 1,000 gals., at t.w. price; 1,000 gals., or more, 1.5c off t.w. on Ethyl and Red Crown, and 1c on Stanolind (latter effective June 9, 1937). Minimum delivery is 25 gals.

S. O. Nebraska

Standard Red Crown Gasoline (*Regular Grade*)

	T.W. Dealer	Gaso-line Taxes	Kero-sine T.W.
Omaha, Neb.	11.5	6	10.3
McCook	11.5	6	10
Norfolk	11.9	6	10.7
North Platte	12.3	6	11
Scottsbluff	13	6	11.8

Discounts to commercial consumers: for tank wagon deliveries covered only by Standard Commercial Consumer Contract, effective January 1, 1935.

S. O. Louisiana

Essolene (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
Little Rock, Ark.	7.25	9.75	7.5	11
Alexandria, La.	6.75	9.25	8	*11.5
Baton Rouge, La.	6.75	9.25	8	*9.5
New Orleans, La.	6.75	9.25	*10	*9
Lake Charles, La.	6.75	9.25	8	*11.5
Shreveport, La.	5.5	8	8	*10
Lafayette, La.	7	9.5	8	*11.5
Bristol, Tenn.	10.25	11	8	14.5
Chattanooga, Tenn.	9.5	12	8	14
Knoxville, Tenn.	10	12.5	8	14.5
Memphis, Tenn.	8	10.5	8	12.5
Nashville, Tenn.	9	11.5	8	12

*Taxes: New Orleans gasoline tax includes 7c state, 1c federal, and 2c parish tax. Louisiana has kerosine tax of 1c per gal.; in addition New Orleans has 1c parish tax, none of which are included in above prices.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Price basis to commercial consumers: Effective May 15, 1937, thru territory; commercial consumers taking 50 gals. or more at one time will be billed at posted consumer t.w. price; those taking less than 50 gals. at one time will be billed at 4c per gal. over posted consumer t.w. price. Generally, the posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Humble Oil & Refining Co.

Humble Motor Fuel (*Regular Grade*)

	*T.W.	S.S.	Gaso-line Taxes	Kero-sine T.W.
Dallas, Tex.	9	12	5	8
Ft. Worth, Tex.	9	13	5	8
Houston, Tex.	9.5	13.5	5	8
San Antonio, Tex.	9	13	5	8

U. S. Motor Gasoline (*Third Grade*)

	*T.W.	S.S.	Gaso-line Taxes
Dallas, Tex.	6	8	5
Ft. Worth, Tex.	7	10	5
Houston, Tex.	7	11.5	5
San Antonio, Tex.	7.5	10.5	5

*Price is t.w. price to all classes of dealers and consumers.

Continental Oil

Conoco Bronze (*Regular Grade*)
Demand (*Third Grade*)

	—Dealer Prices— Conoco Bronz-e-z	De-mand	Gaso-line Taxes	Kero-sine T.W.
Denver, Colo.	10.5	9.5	5	11.5
Grand Junc., Colo.	14	13	5	15
Pueblo, Colo.	11.5	10.5	5	10.5
Casper, Wyo.	12	11	5	11.5
Cheyenne, Wyo.	8	7	5	13
Billings, Mont.	13	10	6	13
Butte, Mont.	13.5	10.5	6	15.5
Great Falls, Mont.	13	11	6	15.5
Helena, Mont.	14	13	6	15.5
Salt Lake City, Utah.	12	10	5	16
Boise, Ida.	13	10.5	6	18
Twin Falls, Ida.	15	12.5	6	18
Albuquerque, N. M.	11	10	†6.5	12
Roswell, N. M.	11	8.5	†6.5	10.5
Santa Fe, N. M.	12	9.5	*7	12
Muskogee, Okla.	9.5	7	5	7
Oklahoma City, Okla.	8.5	6.5	5	7
Tulsa, Okla.	7	5	5	6
Ft. Smith, Ark.	9.25	6.25	5	7.5
Little Rock, Ark.	9.25	7.625	7.5	8
Texarkana, Ark.	9	7	5	8

†Includes city tax of 0.5c.
*Includes 1c city tax.

S. O. California

Standard Gasoline (*Regular Grade*)

	T.W.	S.S.	Gaso-line Taxes	Kero-sine T.W.
San Francisco, Cal.	13.5	14.5	4	11.5
Los Angeles, Cal.	13	14	4	10
Fresno, Cal.	14.5	15.5	4	12.5
Phoenix, Ariz.	15.5	16.5	6	*12.5
Reno, Nev.	15.5	16.5	5	13.5
Portland, Ore.	14	15	6	13.5
Seattle, Wash.	14	15	6	13.5
Spokane, Wash.	17	18	6	16.5
Tacoma, Wash.	14	15	6	13.5

Flight Gasoline (*Third Grade*)

San Francisco, Cal.	12	13	4	....
Los Angeles, Cal.	11.5	12.5	4	....
Fresno, Cal.	13	14	4	....
Reno, Nev.	14	15	5	....
Phoenix, Ariz.	14	15	6	....
Portland, Ore.	12.5	13.5	6	....
Seattle, Wash.	12.5	13.5	6	....
Spokane, Wash.	15.5	16.5	6	....
Tacoma, Wash.	12.5	13.5	6	....

*Arizona has kerosine tax of 5c per gal., not included in above prices.

Discount to dealers: on gasoline, off t.w. price on Standard Ethyl and Standard Gasoline, to 100% dealers, 3c; to split dealers, 2c; on Flight gasoline, both 100% and split dealers, 2c.

On Stanavo Aviation Gasoline, to all classes of dealers, 3c off t.w.

To commercial consumers: off tank wagon price; on single deliveries of 40 gallons and over. Stanavo Aviation, Standard Ethyl and Standard Gasolines, 3c. Flight Gasoline, 2c per gallon. Tank wagon delivery, less than 40 gals., 1c per gal. above posted t.w. price. Discounts on kerosine: in tank cars, 3c off tank truck price; plant deliveries to jobbers, 2.5c below tank truck price.

Canada

PRICES OF IMPERIAL OIL LTD.
Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline (*Regular Grade*)

	T.W	Gasoline Taxes	Kero-sine T.W.
Hamilton, Ont.	16	6	17
Toronto, Ont.	16	6	17
Brandon, Man.	21.1	7	22.3
Winnipeg, Man.	20.5	7	20.7
Regina, Sask.	19	7	21
Saskatoon, Sask.	21.3	7	23.3
Edmonton, Alta.	19.5	7	21.5
Calgary, Alta.	16.5	7	18.5
Vancouver, B. C.	16	7	23
Montreal, Que.	15	6	15
St. John, N. B.	14.5	10	18.5
Halifax, N. S.	14.5	10	18.5

Discounts to undivided dealers, 1c off t.w. price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price, thru territory.

Aviation Gasoline

Following are tank car, tank wagon or dealer prices, as indicated, of aviation gasoline in several marketing territories.

S. O. OHIO
Thru Ohio
Esso Aviation

	Consumer T.W.	Gasoline Taxes
74 octane	15.5	5
80 octane	16.5	5
87 octane	17.5	5

Discounts: For delivery on contract to hangar operators and resellers: 2c below consumer posted t.w. price, shown above.

S. O. INDIANA
Stanavo Ethyl Aviation Gasoline
73 Octane Number

Chicago, Ill.	14.9	4
Detroit, Mich.	16.5	4
Milwaukee, Wis.	15.1	5
Minneapolis, Minn.	15.3	5
St. Louis, Mo.	14.5	3
Kansas City, Mo.	14.2	*4
Fargo, N. D.	16.5	4
Huron, S. D.	15.8	5

*Includes 1c city tax.

HUMBLE OIL & REFINING CO.
Aviation Gasoline

	Tank Car
Baytown, Tex.	8.5

CONTINENTAL OIL CO.
Conoco Special Gasoline

	Dealer	Gasoline Taxes
Denver, Colo.	14.5	5
Cheyenne, Wyo.	15	5
Helena, Mont.	17	6
Salt Lake City, Utah.	17.5	5
Albuquerque, N. M.	14	*6.5

*Includes city tax of 0.5c.

S. O. CALIFORNIA
Stanavo Aviation Gasoline

	T.W.	
Phoenix, Ariz.	17.5	6
Los Angeles, Cal.	15	4
San Francisco, Cal.	15.5	4
Reno, Nev.	17.5	5
Portland, Ore.	16	6
Seattle, Wash.	16	6
Spokane, Wash.	19	6

Note: For discounts, etc., see note under Standard and Flight gasoline above.

Naphtha (In Tank Wagon)

S. O. NEW JERSEY

	Posted Tank Wagon Prices Mineral Spirits	V.M.&P.
Newark, N. J.	11.5	15.5
Baltimore, Md.	15.5	....
Washington, D. C.	15	....

Discounts: Buyers taking following quantities, at one time, get these discounts: Newark, 2c per gal. on 200 gals. or more; less than 200 gals., 0.5c higher price. Baltimore 2c off on 25 to 100 gals. and 3c on over 100 gals. Washington, 2c off to contract buyers.

SOCONY-VACUUM OIL CO.

Buffalo, N. Y.	11	12.5
*New York City	9.5	10.5
Rochester, N. Y.	12	12.5
Syracuse, N. Y.	12.5	15
Boston, Mass.	11.5	11.5
Bridgeport, Conn.	11	11.5
Hartford, Conn.	11	11.5
Providence, R. I.	11.5	12.5

*Prices apply to consumers only in quantities over 1,000 gals. annually. For quantities under 1,000 gals. annually, add 0.5c per gal.

ATLANTIC REFINING CO.

Philadelphia, Pa.	11.5	12.5
Lancaster, Pa.	13	14
Pittsburgh, Pa.	12.5	14.5

Note: Prices for Mineral Spirits also apply to Stoddard Solvent; and prices for V.M.&P. Naphtha apply also to Light Cleaners Naphtha.

S. O. OHIO

	S.R. Solvent	V.M.&P. Naphtha
Thru Ohio	12.5	13.5

Note: V.M.&P. Naphtha prices also apply on Dry Cleaners naphtha and special Varnolene; Varnolene and Sohio Solvent 0.5c below these prices. Discounts to contract consumers, off t.w. price: 300 to 999 gals., 0.5c; 1,000 to 2,499 gals., 0.75c; 2,500 to 4,999 gals., 1c; 5,000 or more gals., 1.5c.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline do not include taxes; they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect Oct. 17, 1938, as posted by principal marketing companies at their headquarters offices, but subject to later correction.

S. O. INDIANA

(Prices include state and federal taxes)

	Oleum Spirits	V.M.&P. Naphtha	Stanisol
Chicago, Ill.	16.2	16.5	15.9
Detroit, Mich	19.2	18.2	19.7
Kansas City, Mo.	13.9	14.9	14.4
St. Louis, Mo.	14.2	15.2	12.9
Milwaukee, Wis.	18.8	19.8	19.3
Minneapolis, Minn.	19	20	17.7

Note: All prices, with exception of Missouri points, include state tax. Prices shown are base prices, before discounts

Naphtha (In Tank Cars)

In Tank Cars (F. o. b. refinery or seaboard terminal except Ohio, delivered price.)

	V.M.&P. Naphtha	Solvent
Baltimore	10.5	9.5
New York Harbor	10	9
Philadelphia district	10.5	9
Boston	10.5	9.5
Providence	10.5	9.5
Ohio points, delivered	8.875	*8

*This is on rubber solvent.

Note: In Ohio, prices on D.C. naphtha and special Varnolene are same as V.M.&P.; on Varnolene and Sohio Solvent, prices are 0.5c less than on V.M.&P

Latest Changes

From Oct. 11 to Oct. 17 inclusive. Dates and amounts of changes shown. See table for full current prices.

Socony-Vacuum Oil—Mobilgas:

Buffalo t. c. cut 0.5c, Oct. 15.

Rochester split dealer t.w. cut 1c, Oct. 11.

Syracuse split dealer t.w. cut 0.5c, Oct. 14.

Kerosine:

Albany cut 0.5c, Oct. 11.

S. O. Nebraska—Red Crown and Kerosine:

Normal prices cut 0.5c, through Nebraska, Oct. 11. Unchanged were McCook, all prices; Norfolk dealer; North Platte dealer and kerosine, and Red Crown t.w. cut 0.1c; Scottsbluff dealer unchanged.

Humble Oil & Refg.—Humble Motor Fuel:
Dallas s. s. cut 1c, Oct. 14.

U. S. Motor:
Dallas s. s. cut 2c, Oct. 14.

Corrections

Notation of amount of change and dates not previously shown in table. Table in this issue is corrected to show these changes.

Socony-Vacuum Oil—Kerosine:
Boston cut 0.5c, Sept. 30.

Atlantic Refining—White Flash Gasoline:
Erie commercial t.c. up 0.5c, dealer t.w. up 1c, Oct. 8.
Jacksonville dealer t.w. up 2c, Oct. 6.

S. O. Indiana—Red Crown, Stanolind and Kerosine:
In the 0.5c cut in normal prices, thru territory, Oct. 8, as announced on page 44 of Oct. 12 issue, the following were exceptions: All prices unchanged at Detroit and Grand Rapids; Red Crown and Stanolind dealer prices unchanged at Quincy and Wichita; Stanolind dealer prices unchanged at Chicago, Decatur, Des Moines, Indianapolis, Kansas City, Saginaw, St. Louis, and South Bend. Kerosine unchanged at Green Bay, Kansas City, Saginaw, South Bend and Wichita.

Continental Oil—Conoco Bronz-z-z and Demand:
Cheyenne dealer price up 1c, Oct. 4; cut 1c, Oct. 7.

Wax

NEW YORK, Oct. 17. — Reports of lower-priced offerings of white crude scale wax continued to be heard in the New York market the week ended Oct. 15.

Generally, however, prices for scale grades continued to be reported at 2.35 cents per pound. Some sellers who had been quoting above this figure reported dropping back to the 2.35-cent level.

Buying of wax generally was said to be "about normal". No large sales were reported during the week.

N. Dakota Inshipments Break All Records

BISMARCK, N. D., Oct. 14.—Shipments of gasoline, kerosine, and tractor fuel into North Dakota broke all records during August, when these totaled 21,844,816 gallons, exceeding by 2,750,580 gallons, or 14.4 per cent, inshipments of a year ago, according to the Oil Inspection Division of the North Dakota Regulatory Department.

Only three months in the history of the state have shown higher inshipments of gasoline. These were September, 1928, with 17,793,000 gallons; August, 1929, with 19,429,000 gallons; and August, 1930, with 17,398,000 gallons. These compare with 17,301,603 gallons of gasoline in August this year.

Shipments of gasoline into North Dakota the first eight months this year totaled 88,692,176 gallons, an increase of 7,676,204 gallons or 9.5 per cent, over the corresponding period of last year.

Shipments of the three products into the state during the first eight months totaled 112,865,528 gallons, an increase of 9.3 per cent over the corresponding period last year.

Aircraft Exports From U. S. Gain

WASHINGTON, Oct. 14. — Total exports of aeronautic products amounted to $48,693,213 for the first eight months of 1938, an increase over the same 1937 period of 106 per cent, Dept. of Commerce announces. This sum is 23 per cent over the entire bill for 1937, it is stated.

Aircraft accounted for 57 per cent of this total, or $27,936,390, parts and accessories accounted for 32 per cent of the total, engines 11 per cent, with the remainder going for parachutes, etc. The August export total was $5,379,621, or $220,000 more than was exported in August, 1937.

CLEVELAND, Oct. 14.—The eighth annual meeting and sales conference of the Porcelain Enamel Institute will be held at Hotel Statler, Nov. 16 and 17, according to a current announcement. The meeting had been previously announced for Oct. 25 and 26.

TANK WAGON MARKETS, HEATING OILS

Prices in Effect Oct. 17, 1938

Following are posted tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

	No. 1	No. 2	No. 4
S. O. NEW JERSEY			
Atlantic City, N. J.	8.0	6.0	6.0
Newark	8.0	6.0	6.0
Annapolis, Md.	....	6.25	....
Baltimore	7.5	6.5	6.0
Washington, D. C.	7.25	6.5	6.5
Norfolk, Va.	7.0	6.0	6.0
Petersburg	7.25	6.25	....
Richmond	7.25	6.25	6.25
Charlotte, N. C.	8.75	7.75	....
Hickory	....	8.25	....
Raleigh	8.75	7.25	....
Charleston, S. C.	8.5	7.0	....
Columbia	9.5	8.0	....
Spartanburg	10.2	8.7	....

SOCONY-VACUUM OIL CO. INC.
(S. O. New York Division)

	No. 2	No. 3	No. 4
New York City	6.50	6.50	6.50
Albany, N. Y.	6.50	6.50	6.00
Rochester, N. Y.	7.50	7.50	7.50
Boston, Mass.	6.00	6.00	6.00
Bangor, Me.	7.0	7.0	7.0
Manchester, N. H.	6.50	6.50	6.50
Burlington, Vt.	8.00	8.00	8.00
Hartford, Conn.	6.00	6.00	6.00
New Haven, Conn.	5.25	5.25	5.25
Providence, R. I.	6.00	6.00	6.00

Note: Prices for No. 1 fuel in Socony-Vacuum territory same as for kerosine which see in tank wagon table for various cities; prices change with kerosine.

	No. 1	No. 2	No. 3	No. 4
ATLANTIC REFINING Cont'd				
Philadelphia, Pa.	7.75	6.00	6.00	6.00
Allentown, Pa.	8.50	6.50	6.50	6.50
Wilmington, Del.	7.75	6.00	6.00	6.00
Springfield, Mass.	8.00	6.50	....	6.50
Worcester, Mass.	8.00	6.00	....	6.00
Hartford, Conn.	7.00	6.00	....	6.00
S. O. OHIO				
Columbus Division and Cleveland	7.50	7.50	7.00	....
City of Lima	8.00	8.00	7.00	....
Rest of Ohio	8.00	8.00	7.50	....

Note: S. O. Ohio prices are for full compartment hose dumps, bucket dumps are 0.5c per gallon higher.

S. O. INDIANA
Stanolex Fuel and Furnace Oils

	No. 1 Fuel	Stanolex Furnace
Chicago	(a)6.5	6.5
Indianapolis		(b)7.8
Detroit		7.1
Milwaukee	8.4	7.7
Minneapolis	7.8	7.8
St. Louis	7.7	(c)6.7
Kansas City	6.8	6.8

(a) For 100 gals. and over; 150 to 399 gals., 7c; 1 to 149 gals., 8c.
(b) Excluding 4c state tax.
(c) For 400 gals & over; 100 to 399 gals., 7c; 1 to 99 gals., 8c.

Note: Small-lot deliveries of light fuel oils range up to 2c higher than above quotations.

SEABOARD MARKETS, EXPORT AND COASTWISE

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). In cargo markets, spot shipment is 90 days. Prices in cents per gallon, except heavy fuel oil in dollars per barrel, in tank car lots, f.o.b. refineries or seaboard terminals in districts designated, unless otherwise noted. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Eastern Domestic

(Inter-refinery and export prices not included.)

MOTOR GASOLINE

Prices Effective	Oct. 17	
District:	**(a)60-64 Oct.**	**(a) 65 Oct. & Above**
N. Y. harbor	6.00 – 6.75	6.00 – 6.75
(b)N. Y. harbor	5.75 – 6.50	5.75 – 6.50
Philadelphia	6.00 – 6.50	6.25 – 6.50
Baltimore	6.00 – 6.50	6.25 – 6.50
Norfolk	6.50 – 7.00	6.75 – 7.25
Wilmington, N. C.	6.50 – 7.00	6.75 – 7.25
Charleston, S. C.	6.50 – 7.00	6.75 – 7.25
Savannah	6.50 – 7.00	6.50 – 7.25
Jacksonville	6.00 – 7.00	6.50 – 7.25
Portland	7.00 – 7.50	7.00 – 7.50
Boston	6.25 – 7.00	6.50 – 7.00
Providence	6.25 – 7.00	6.50 – 7.00

WATER WHITE KEROSINE

District:			
N. Y. harbor	4.75 -5.00	Charleston	5.00–5.25
(b)N. Y. harbor	4.625–4.875	Savannah	5.00–5.25
Philadelphia	4.75–5.00	Jacksonville	5.00–5.25
Baltimore	5.00–5.25	Portland	5.60
Norfolk	5.00–5.25	Boston	4.75–5.00
Wilmington, N.C.	5.00–5.25	Providence	4.75–5.00

(c)FUEL OILS

	N. Y. harb.	N. Y. harb. barges
No. 1	4.75 – 5.00	4.625– 4.875
Nos. 2-3	4.125– 4.25	3.875– 4.125
No. 4	3.875– 4.25	3.75 – 4.125
No. 5	(a)$1.15	.....
No. 6	$0.85 –$0.95	.....

	Phila. dist.	Balt. dist.
No. 1	4.75 – 5.00	5.00 – 5.25
Nos. 2-3	4.25	4.25
No. 4	4.00	4.00 – 4.25
No. 5	$1.15	$1.15
No. 6	$0.95	$0.95

	Bost. dist.	Prov. dist.
No. 1	4.75 – 5.00	4.75 – 5.00
Nos. 2-3	4.10 – 4.25	4.25
No. 4	4.00 – 4.25	4.00 – 4.25
No. 5	$1.15	$1.15
No. 6	$0.95	$0.95

District:	(d)Bunker C Fuel	(d)Diesel Oil
N. Y. harbor	(f)$0.95	(g)$1.75
Philadelphia	(f)$0.95	(g)$1.75
Baltimore	(f)$0.95	(g)$1.75
Norfolk	(e)$0.95	$1.75
Charleston	$0.90	$1.75
Savannah	(e)$0.90	$1.785
Jacksonville	(e)$0.90	$1.785
Tampa	(e)$0.85	$1.785
Portland	$1.05	$1.85
Boston	(f)$0.95	(g)$1.75
Providence	$0.95	$1.75

	Gas Oil 28-34 Gravity	Diesel Oil Shore Plants
N. Y. harbor	4.00 – 4.25	4.00 – 4.25
Philadelphia dist.	4.25	....
Baltimore dist.	4.25	....
Norfolk dist.	4.25	....
Savannah dist.	....	4.25
Jacksonville dist.	....	4.25

Pacific Export

(i) (Quotations are at seaboard, Los Angeles, in cargo lots, cents per gal., except where otherwise noted.)

Prices Effective	Oct. 17	Oct. 10
U. S. Motor, under 65 oct.	4.875– 5.00	4.875– 5.00
400 e.p. blend, under 65 oct.	5.00 – 5.125	5.00 – 5.125
400 e.p. blend 65 oct. & above	5.125– 5.375	5.125– 5.375
(h) 38-40 w.w. kerosine	4.25 – 4.75	4.25 – 4.75
41-43 w.w. kerosine	4.75 – 5.00	4.75 – 5.00
44 w.w. kerosine	5.25 – 5.50	5.25 – 5.50
In Cargo lots, per bbl.		
Dieselfuel, 24° & above	$1.05 –$1.20	$1.05 –$1.20
Diesel fuel, under 24°	$0.95 –$1.05	$0.95 –$1.05
(h)30-34 diesel (gas oil)	$1.17 –$1.25	$1.17 –$1.26
(k) Grade C fuel oil	$0.60 –$0.70	$0.60 –$0.70

Prices Effective	Oct. 17	Oct. 10
In Ships' Bunkers, or deep tank lots, per bbl.:		
(j)Diesel fuel oil	$1.525–$1.55	$1.525–$1.55
(k)Grade C fuel oil	$0.70 –$0.90	$0.70 –$0.90
Cased Goods: (Per case)		
U. S. Motor	$1.40 –$1.525	$1.40 –$1.525
400 e.p. blend, under 65 octane	$1.50 –$1.60	$1.50 –$1.60
375–400 e.p. blend, 65 oct. & above	$1.60 –$1.70	$1.60 –$1.70
(h)40-43 w.w. kerosine	$1.30 –$1.40	$1.30 –$1.40
Kerosine, p.w.	$1.25 –$1.35	$1.25 –$1.35

New York Export

(Cents per gal. in bbls. F.a.s. New York)

CYLINDER OILS (Pennsylvania Products)

Bright stock:		
Light, 25 p.t.	21.50	21.50
Neutral oil:		
200 3 color, 25 p.t.	22.50	22.50
150 3 color, 25 p.t.	21.50	21.50
600 s.r., unfiltered	15.50 –16.50	15.50 –16.50
650 s.r., unfiltered	17.50 –18.50	17.50 –18.50
600 fl., s.r.	18.00 –19.00	18.00 –19.00
630 fl., s.r.	20.50 –21.50	20.50 –21.50

Wax, Domestic *and* Export

(A.S.T.M. Tests. Melting points, however, are A.M.P., 3° higher than E.M.P. Export prices, f.a.s., carloads. Domestic prices, f.o.b. refineries in New Orleans & New York districts in bags, carloads, with 0.2c discount allowed for shipment in bulk, except where noted below. Scale solid; fully refined, slabs in bags)

Prices Effective	Oct. 17	
	New York	
	Domestic	**Export**
124-6 Y.C. scale	2.35 – 2.50	2.35 – 2.50
122-4 W.C. scale	2.35 – 2.50	2.35 – 2.50
124-6 W.C. scale	2.35 – 2.50	2.35 – 2.50
123-5 Fully rfd.	3.75	3.375– 3.50
125-7 Fully rfd.	3.90	3.50 – 3.625
128-30 Fully rfd.	(l)4.00	3.65 – 3.875
130-2 Fully rfd.	(l)4.35	4.00 – 4.125
133-5 Fully rfd.	(l)4.65	4.40 – 4.625
135-7 Fully rfd.	(l)4.90	5.00 – 5.125
	New Orleans	
	Domestic	**Export**
124-6 Y.C. scale	2.35 – 2.50	2.35 – 2.50
122-4 W.C. scale	2.35 – 2.50	2.35 – 2.50
124-6 W.C. scale	2.35 – 2.50	2.35 – 2.50
123-5 Fully rfd.	3.75	3.375– 3.50
125-7 Fully rfd.	3.90	3.50 – 3.625
128-30 Fully rfd.	(l)4.00	3.65 – 3.875
130-2 Fully rfd.	(l)4.35	4.00 – 4.125
133-5 Fully rfd.	(l)4.65	4.40 – 4.625

Gulf Coast

(F.o.b. ship, Gulf oil terminals; minimum 20,000 bbls.; representing traders' opinions)

Prices Effective	Oct. 17	Oct. 10
For Domestic shipment:		
MOTOR GASOLINE		
59 oct. & below	4.50 – 4.625	4.625– 4.75
60-64 oct.	4.625– 4.75	4.625– 4.875
65-67 octane	4.75 – 5.00	4.875– 5.125
68-70 octane	5.00 – 5.25	5.125– 5.50
FUEL OILS		
No. 1	3.75 – 4.00	3.75 – 4.00
No. 2	3.50	3.50
KEROSINE		
41-43 w.w.	3.875– 4.125	3.875– 4.125
For Export Shipment:		
GASOLINE		
U. S. Motor	4.50 – 4.625	4.625– 4.75
60-62, 400 e.p.	4.50 – 4.625	4.625– 4.75
61-63, 390 e.p.	4.50 – 4.75	4.625– 5.00
64-66, 375 e.p.	4.50 – 4.75	4.625– 5.00
KEROSINE		
44 w.w.	(a) 4.25 –4.50	(a) 4.25 –4.50
41-43 w.w.	3.875– 4.125	3.875– 4.125
41-43 p.w.	3.875– 4.125	3.875– 4.125

Prices Effective	Oct. 17	Oct. 10
GAS AND BUNKER OILS		
For Export Shipment		
Gas Oil (m):		
Below 43 diesel index	3.50	3.50
43-47 diesel index	3.50 – 3.625	3.50 – 3.625
48-52 diesel index	(a) 3.50 –3.625	(a) 3.50 –3.625
53-57 diesel index	(a) 3.625–3.75	(a)3.625–3.75
For Domestic and /or Export Shipment		
Diesel Oil Ship's bkrs.	(o)$1.55	(o)$1.55
Grade C bunker oil for ship's bunkers	(o)$0.75	(o)$0.75
Grade C bunker oil, in cargoes	$0.60 –$0.65	$0.60 –$0.65

MID-CONTINENT LUBRICATING OILS

(Cents per gal. at Gulf; in bbls., f.a.s.; in bulk, f.o.b. terminals)

	Oct. 17	
190-200 vis. D. 210 brt. stock	(p)Barrels 22.50 –24.50	Bulk 17.60 –17.75
150-160 vis. D 210 brt. stock:		
0-10 p.p.	19.00 –20.50	13.00 –14.75
10-25 p.p.	18.50 –20.00	12.50 –14.25
150-160 vis. E 210 brt. stock	18.50 –20.00	13.00 –14.50
120 vis. D 210 brt. stock	18.50 –20.00	13.00 –14.50

	Oct. 17	Oct. 10
180 vis. No. 3 color neutral:	Bulk	Bulk
0-10 p.p.	10.00 –10.50	10.00 –10.50
15-30 p.p.	9.50 –10.00	9.50 –10.00
200 vis. No. 3 color neutral:		
0-10 p.p.	10.00 –10.50	10.00 –10.50
15-30 p.p.	9.50 –10.00	9.50 –10.00
600 s.r. olive green	9.00 –11.25	9.00 –11.25
600 s.r. dark green	7.00 – 9.25	7.00 – 9.25

SOUTH TEXAS LUBRICATING OILS

(Vis. at 100° cold test 0, bulk export shipment, f.o.b. terminals.)

Unfiltered Pale Oils.		
Vis. Color		
100 No. 3	4.75 – 5.00	4.75 – 5.00
200 No. 3	6.25 – 6.75	6.25 – 6.75
300 No. 3	6.75 – 7.25	6.75 – 7.25
500 No. 3½	7.50 – 8.25	7.50 – 8.25
750 No. 4	8.25 – 8.75	8.25 – 8.75
1200 No. 4	8.75 – 9.25	8.75 – 9.25
2000 No. 4	9.00 – 9.50	9.00 – 9.50
Red Oils:		
Vis. Color		
100 No. 5-6	4.75 – 5.00	4.75 – 5.00
200 No. 5-6	6.25 – 6.75	6.25 – 6.75
300 No. 5-6	6.75 – 7.25	6.75 – 7.25
500 No. 5-6	7.50 – 8.25	7.50 – 8.25
750 No. 5-6	8.25 – 8.75	8.25 – 8.75
1200 No. 5-6	8.75 – 9.25	8.75 – 9.25
2000 No. 5-6	9.00 – 9.50	9.00 – 9.50

Note: Red oil prices cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

Tanker Rates

(Approximate freight rates to Continental ports, shillings per ton of 2240 lbs., British sterling; U.S. ports cents per bbl.)

Rates Effective Oct. 17

	Crude & /or Fuel		Refined Oil & /or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Gulf-U.K./Cont.(q)	12/	12/6-13/	12/	13/-14/
Aruba-U.K./Cont.(q)	10/	10/6-11/6	11/3	11/6-12
Gulf-N. Atlantic (r) (not E. of N.Y.): Hvy. Crude & fuel, (10 to 19.9 gravity)	17.5c	19c	....	....
Light Crude, (30 Grav. or Lighter)	16c	16-17c	....	....
Gasoline	....	....	20c	20-21c
Kerosine	....	....	20c	20-21c
Light Fuel	....	....	21c	20-21c

(a) Prices nominal. (b) In barge lots. (c) Fuel oils meet specifications of U. S. Commercial Standards CS12-35. (d) In ships' bunkers. (e) For barging, add 5c per bbl. (f) For barging, add 5c to 6c per bbl. (g) For barging, add 6.5c to 7.5c per bbl. (h) 150 fire point. (i) For San Francisco cargo prices, add 5c per bbl. to cargo prices shown above. (j) Pacific Specification 200. (k) Pacific Specification 400. (l) Shipment either in bags or in bulk. (m) Less than ½ of 1% sulfur. (n) No prices reported. (o) Barging 5c per bbl. additional at some Gulf ports. (p) Second-hand barrels. (q) Continental ports in range between Bordeaux and Hamburg, both inclusive. (r) Venezuela loading, same rate; Tampico, 2c to 3c per bbl. additional. (s) Low pour test, low viscosity, No. 5 generally quoted at $1.25.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency

(Effective Sept. 1, 1938, except Corning Oct. 18, 1938)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$1.34
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$1.28
Penna. Grade Oil in Buckeye Pipe Lines (Mackaburg, O.).....$1.18
Corning Oil in Buckeye Pipe Lines (Ohio)...$0.97

Posted by Other Companies

Tide Water Associated Oil Co.
Bradford-Allegany district (Penna. and N. Y.) (Effective Sept. 1, 1938).....$1.68
*The Pennzoil Co.: (Effective Sept. 1, 1938)
Penna. Grade Oil in National Transit Lines*$1.61
*The Pennzoil Co. posts $1.61 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other lower districts range down to $1.56 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.

Midland, Midland County (Oct. 2, 1938)... $1.025

Posted by Simrall Corp.

(Effective Oct. 13, 1938)

Allegan, Crystal, Greendale, Porter and equal grades.....$0.925
Beaverton, Buckeye, Bentley, Edenville...$0.90
Freeman.....$0.87
West Branch, Arenac, and equal grades....$0.74

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

(Effective Oct. 13, 1938)

Illinois and Princeton.....$1.05
Illinois Basin.....$1.15
Owensboro, (Western Ky.).....$1.10
Lima, O.....$0.90

Posted by Owensboro Corp.

Illinois:
Beecher City (Effective Oct. 13, 1938).....$1.15
Centralia Field:
Congested District (Effective Oct. 1, 1938).$1.15
Area Outside Congested District (Effective Oct. 13, 1938).....$1.15

Posted by Carter Oil Co.

(Effective Oct. 14, 1938)

Louden, Fayette County, Ill.....$1.15

Posted by Ashland Oil & Transportation Co.

(Effective Oct. 14, 1938)

Somerset Oil in Ashland Lines, Kentucky:
Big Sandy River.....$1.12
Kentucky River.....$1.20

Posted by Stoll Oil Refining Co.

(Effective Oct. 12, 1938)

Stoll Pipe Line Oil (Ky.).....$1.10

Posted by Fordsville Gathering Line, Inc.

(Effective Oct. 13, 1938)

Birk City Field, Ky.....$1.10
Owensboro District, Ky.....1.10

CANADIAN FIELDS

Posted by Imperial Oil Limited

Western Ontario

(Effective Sept. 9, 1933)

Petrolia.....$2.10
Oil Springs.....$2.17

Alberta—Turner Valley

(Prices f.o.b. field tankage)

(Effective Jan. 5, 1938)

Crude Oil			
40-40.9°.....$1.14		53-53.9.....$1.40	
41-41.9..... 1.16		54-54.9..... 1.42	
42-42.9..... 1.18		55-55.9..... 1.44	
43-43.9..... 1.20		56-56.9..... 1.46	
44-44.9..... 1.22		57-57.9..... 1.48	
45-45.9..... 1.24		58-58.9..... 1.50	
46-46.9..... 1.26		59-59.9..... 1.52	
47-47.9..... 1.28		60-60.9..... 1.54	
48-48.9..... 1.30		61-61.9..... 1.56	
49-49.9..... 1.32		62-62.9..... 1.58	
50-50.9..... 1.34		63-63.9..... 1.60	
51-51.9..... 1.36		64-64.9..... 1.62	
52-52.9..... 1.38			
Crude Naphtha, 65 grav. & above.....$2.14			
Absorption Gasoline			
90% Rec., 20 lb. Reid v.p.....$1.94			
90% Rec., 17 lb. Reid v.p.....$2.08			

MID-CONTINENT

Oklahoma-Kansas

Effective	S. O. Indiana Continental *Oct. 11 1938*	*Carter *Magnolia *Sinclair-Prairie	Shell Petr.	Texas Co.
			Oct. 11 1938	*Oct. 12 1938*
Below 21°.		$0.60	$0.78	
21-21.9....		.63	for	
22-22.9....		.66	oil	
23-23.9....		.69	below	
24-24.9....	$0.86	.72	25°	
25-25.9....	for	.75	$0.80	
26-26.9....	oil	.78	.82	
27-27.9....	below	.81	.84	
28-28.9....	29°.	.84	.86	$0.86
29-29.9....	$0.88	.87	.88	.88
30-30.9....	.90	.90	.90	.90
31-31.9....	.92	.92	.92	.92
32-32.9....	.94	.94	.94	.94
33-33.9....	.96	.96	.96	.96
34-34.9....	.98	.98	.98	.98
35-35.9....	1.00	1.00	1.00	1.00
36-36.9....	1.02	1.02	1.02	1.02
37-37.9....	1.04	1.04	1.04	1.04
38-38.9....	1.06	1.06	1.06	1.06
39-39.9....	1.08	1.08	1.08	1.08
40 & above	1.10	1.10	1.10	1.10

*Effective, by Carter, Oct. 13, posting only in Okla.; Magnolia, Oct. 12, posting only in Okla.; Sinclair-Prairie, Oct. 14, in Okla.-Kans., with lowest grade 21-21.9.

North-North Central Texas

Effective, 1938:	Stanolind *Oct. 11*	*Texas Co. *Continental	Magnolia *Oct. 12*
Below 29°	$0.76	$0.79	$0.79
29-29.9	.78	.81	.81
30-30.9	.80	.83	.83
31-31.9	.82	.85	.85
32-32.9	.84	.87	.87
33-33.9	.86	.89	.89
34-34.9	.88	.91	.91
35-35.9	.90	.93	.93
36-36.9	.92	.95	.95
37-37.9	.94	.97	.97
38-38.9	.96	.99	.99
39-39.9	.98	1.01	1.01
40-40.9	1.00	1.03	1.03
41-41.9	for	for	1.05
42-42.9	oil	oil	1.07
43-43.9	40 &	40 &	1.09
44-44.9	above.	above.	1.11
45 & above	....	....	1.13

*Effective Oct. 11, by Continental, in North Tex.; Oct. 12, by Texas Co. in North & North Central Texas. Texas Co.'s lowest grade is 28-28.9, at $0.79

Jefferson County, Texas

	Beaumont (Magnolia) (Oct. 12, 1938)	West Beaumont (Humble) (May 1, 1938)
Below 20°	$0.79	
20-20.9	0.82	$0.95
21-21.9	0.85	0.98
22-22.9	0.88	1.01
23-23.9	0.91	1.04
24-24.9	0.94	1.07
25-25.9	0.97	1.10
26-26.9	1.00	1.13
27-27.9	1.02	1.15
28-28.9	1.04	1.17
29-29.9	1.06	1.19
30-30.9	1.08	1.21
31-31.9	1.10	1.23
32-32.9	1.12	1.25
33-33.9	1.14	1.27
34-34.9	1.16	1.29
35-35.9	1.18	1.31
36-36.9	1.20	1.33
37-37.9	1.22	1.35
38-38.9	1.24	1.37
39-39.9	1.26	1.39
40 & above	1.28	1.41

Oct. 11, '38, Stanolind Oil & Gas Co. posted same gravity and price schedule in West Beaumont field as Magnolia.

TEXAS FIELDS

Posted by Humble Oil & Refining Co.

*(*West Central Texas)*

(Effective Oct. 11, 1938)

24-24.9	$0.71	35-35.9	$0.93
25-25.9	.73	36-36.9	.95
26-26.9	.75	37-37.9	.97
27-27.9	.77	38-38.9	.99
28-28.9	.79	39-39.9	1.01
29-29.9	.81	40-40.9	1.03
30-30.9	.83	41-41.9	1.05
31-31.9	.85	42-42.9	1.07
32-32.9	.87	43-43.9	1.09
33-33.9	.89	44-44.9	1.11
34-34.9	.91	45 & above	1.13

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young counties.

Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60F.

*(*East Central Texas*

(Effective Oct. 11, 1938)

23-23.9	$0.78	32-32.9	$ .96
24-24.9	.80	33-33.9	.98
25-25.9	.82	34-34.9	1.00
26-26.9	.84	35-35.9	1.02
27-27.9	.86	36-36.9	1.04
28-28.9	.88	37-37.9	1.06
29-29.9	.90	38-38.9	1.08
30-30.9	.92	39-39.9	1.10
31-31.9	.94	40 and above	1.12

*Including Anderson, Cherokee, Limestone, Navarro counties.

PANHANDLE TEXAS

Posted by Humble Oil & Refining Co.

	Gray County	Carson-Hutchinson
(Effective Oct. 11, 1938)		
28-28.9	$0.72	$0.67
29-29.9	0.74	0.69
30-30.9	0.76	0.71
31-31.9	0.78	0.73
32-32.9	0.80	0.75
33-33.9	0.82	0.77
34-34.9	0.84	0.79
35-35.9	0.86	0.81
36-36.9	0.88	0.83
37-37.9	0.90	0.85
38-38.9	0.92	0.87
39-39.9	0.94	0.89
40-40.9	0.96	0.91
41-41.9	0.98	0.93
42-42.9	1.00	0.95
43-43.9	1.02	0.97
44-44.9	1.04	0.99
45 & above	1.06	1.01

EAST TEXAS

(Effective *Oct. 11, 12, 13, 1938)

Gulf, Humble, Magnolia, Stanolind, Texas Co., Tide-Water Associated.....$1.10
*Effective Oct. 11 by Humble and Stanolind; Oct. 12 Magnolia, Texas, Tide Water; Oct. 13 by Gulf.

Shell also posted on Oct. 11, 1938, in Livingston area, Polk County, Texas, $1.10.

NORTHEAST TEXAS

(Posted by Humble, Oct. 11, 1938)

Talco.....$0.55

(Posted by Magnolia, Oct. 12, 1938)

Cass County and Panola County, Tex.:
Same gravity and price schedule as S. O. Louisiana posts for N. La.-Ark. Crude, which see under that company.

(Posted by The Texas Co., Oct. 12, 1938)

Cass County.....$1.05

WEST TEXAS AND NEW MEXICO

Posted by Humble Oil & Refining Co.

(Effective Oct. 11, 1938)

(Including Andrews, Crane, Crockett, Ector, *Gaines, Glasscock, Howard, *Reagan, Upton, Winkler and *Yoakum Counties, Texas and Lea county, New Mexico).

Below 20	$0.53	30-30.9	$0.75
20-20.9	.55	31-31.9	.77
21-21.9	.57	32-32.9	.79
22-22.9	.59	33-33.9	.81
23-23.9	.61	34-34.9	.83
24-24.9	.63	35-35.9	.85
25-25.9	.65	36-36.9	.87
26-26.9	.67	37-37.9	.89
27-27.9	.69	38-38.9	.91
28-28.9	.71	39-39.9	.93
29-29.9	.73	40 & above	.95

Pecos, West Texas.....$0.78

*Added to this posting, Aug. 29, 1938.

Oct. 12, '38, Magnolia met Humble in Crane, Glasscock, Howard, Mitchell, Upton and Winkler counties, except that its lowest grade is below 25 at $0.63.

Oct. 11, '38, Shell Petroleum met Humble in Crane, Ector, Glasscock, Howard, Upton and Winkler counties, Tex., and Lea county, N. M., except that its highest grade is 36 & above, at $0.87. It met Humble in Pecos, and in Pecos county Yates shallow pool, posted $0.65.

Oct. 11, '38, Stanolind Oil & Gas Co. met Humble in Hendrick field, Winkler, except that its lowest grade is below 26 at $0.65.

Oct. 12, '38, The Texas Co. posted in Ward and Winkler counties, Tex., and Lea county, N. M., same prices as Humble in West Texas, except that its lowest grade is below 26, at $0.65, and its highest grade, 36 and above, at $0.87.

Posted by Continental Oil Co.

(Effective Oct. 11, 1938)

Artesia, Jackson and Maljamar pools, New Mexico: gravity schedule beginning with below 29, at $0.61; 29-29.9, at $0.63; plus 2c differential for each gravity, up to 40 & above, at $0.85.

COLORADO

Posted by Continental Oil Co.

(Effective Oct. 11, 1938)

Ft. Collins and Wellington

Below 29	$0.81	35-35.9	$0.95
29-29.9	.83	36-36.9	.97
30-30.9	.85	37-37.9	.99
31-31.9	.87	38-38.9	1.01
32-32.9	.89	39-39.9	1.03
33-33.9	.91	40 & above	1.05
34-34.9	.93		

Canon City and Florence, Col.....$0.90

SOUTH AND SOUTHWEST TEXAS

All Shown Below Posted by Humble Oil & Refining Co.

(Effective Oct. 11, 1938)

Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski crudes.....$0.96
Van crude.....$0.93
Flour Bluff.....$1.27
Pettus.....$1.29

Oct. 12, '38, Magnolia met Humble in Darst Creek; posted $0.87 in Luling; $0.99 in Lytton Springs; $1.14 for Cleveland, and $1.02 in Hardin, both in Liberty county, Tex.

Oct. 12, '38, The Texas Co. met Humble in Darst Creek.

*(*Anahuac and Dickinson*

(Effective Oct. 11, 1938)

Below 20°	$0.74	33-33.9	$1.09
20-20.9	.77	34-34.9	1.11
21-21.9	.80	35-35.9	1.13
22-22.9	.83	36-36.9	1.15
23-23.9	.86	37-37.9	1.17
24-24.9	.89	38-38.9	1.19
25-25.9	.92	39-39.9	1.21
26-26.9	.95	40-40.9	1.23
27-27.9	.97	41-41.9	1.25
28-28.9	.99	42-42.9	1.27
29-29.9	1.01	43-43.9	1.29
30-30.9	1.03	44-44.9	1.31
31-31.9	1.05	45 & above	1.33
32-32.9	1.07		

*Includes Barbers Hill, Cedar Point, Fairbanks, Gillock, Hull, Liberty, Orange, Pierce Junction and Raccoon Bend (shallow sand).

Raccoon Bend (Deep sand crude) Tomball and Satsuma

(Effective Oct. 11, 1938)

22-22.9	$0.95	34-34.9	$1.19
23-23.9	.97	35-35.9	1.21
24-24.9	.99	36-36.9	1.23
25-25.9	1.01	37-37.9	1.25
26-26.9	1.03	38-38.9	1.27
27-27.9	1.05	39-39.9	1.29
28-28.9	1.07	40-40.9	1.31
29-29.9	1.09	41-41.9	1.33
30-30.9	1.11	42-42.9	1.35
31-31.9	1.13	43-43.9	1.37
32-32.9	1.15	44-44.9	1.39
33-33.9	1.17	45 & above	1.41

(Continued on next page)

CRUDE OIL MARKETS *(Continued from preceding page)*

South-Southwest Texas (cont'd)

(Effective Oct. 11, 1938)

Conroe.....$1.27

Jefferson County, Tex.

For Beaumont, see prices by Humble, Magnolia and Stanolind on previous page.

Posted by Humble

**Mirando*

(Effective Oct. 11, 1938)

Below 20°	$0.74	33-33.9	$1.09
20-20.9	.77	34-34.9	1.11
21-21.9	.80	35-35.9	1.13
22-22.9	.83	36-36.9	1.15
23-23.9	.86	37-37.9	1.17
24-24.9	.89	38-38.9	1.19
25-25.9	.92	39-39.9	1.21
26-26.9	.95	40-40.9	1.23
27-27.9	.97	41-41.9	1.25
28-28.9	.99	42-42.9	1.27
29-29.9	1.01	43-43.9	1.29
30-30.9	1.03	44-44.9	1.31
31-31.9	1.05	45 & above	1.33
32-32.9	1.07		

*Includes Duval, Jim Hogg, Jim Wells, Webb and Zapata counties, Tex. and Heyser and Placedo crudes.

Oct. 12, '38, Texas Co. posted for Duval-Mirando, $0.77 for below 21, plus 3c differential to 26-26.9, $0.95; 27-27.9, $0.97; 28 & above, $0.99.

LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana

(Effective Oct. 5, 1938)

	*N. La.-Ark.	†Columbia County, Ark.	‡South Louisiana
Below 21°	$0.73	$0.66	$0.74
21-21.9	for	for	.77
22-22.9	oil	oil	.80
23-23.9	Below	Below	.83
24-24.9	25°	25°	.86
25-25.9	$0.75	$0.68	.89
26-26.9	.77	.70	.92
27-27.9	.79	.72	.94
28-28.9	.81	.74	.96
29-29.9	.83	.76	.98
30-30.9	.85	.78	1.00
31-31.9	.87	.80	1.02
32-32.9	.89	.82	1.04
33-33.9	.91	.84	1.06
34-34.9	.93	.86	1.08
35-35.9	.95	.88	1.10
36-36.9	.97	.90	1.12
37-37.9	.99	.92	1.14
38-38.9	1.01	.94	1.16
39-39.9	1.03	.96	1.18
40 & above	1.05	.98	1.20

(Effective Oct. 5, 1938)

Smackover, Ark.....$0.73

Urania, La. (Ark. Fuel Oil Co., Jan. 28, '37)...$1.02

*Includes Bunkie, Caddo, Carterville, DeSoto, Homer, Haynesville, Rodessa, Sabine and Sarepta, in N. La.; El Dorado and Miller County, Ark. (latter is Ark. part of Rodessa field).

Note: S. O. Louisiana prices in all La.-Ark. fields, effective Oct. 5, 1938, are on 100% tank table basis.

†Includes Buckner, Magnolia, and Village pools.

‡Includes these fields: Baton Rouge, Bayou, Choctaw, Cheneyville, Darrow, Jeanerette, Lirette, N. Crowley and Roanoke.

Posted by Continental Oil Co.

(Effective Oct. 11, 1938)

*Tepetate and *Ville Platte, La.....$1.03

Oct. 12, 1938, Magnolia Petroleum and The Texas Co. posted same gravity and price schedule as S. O. La. posts in N. La.-Ark. in these fields: Magnolia, in Bull Bayou, Cotton Valley, Haynesville, Pine Island, and Rodessa, La., and Eldorado and Rainbow, Ark.; Texas Co. in N. La. Both also met S. O. La. in Smackover. Texas Co. posted $1.24 for Garden Island, La. and $1.04 for Lafitte, La.

***GULF COASTAL FIELDS**

Posted by Humble Oil & Refining Co.

(Effective Oct. 11, 1938)

Below 20	$0.79	30-30.9	$1.08
20-20.9	.82	31-31.9	1.10
21-21.9	.85	32-32.9	1.12
22-22.9	.88	33-33.9	1.14
23-23.9	.91	34-34.9	1.16
24-24.9	.94	35-35.9	1.18
25-25.9	.97	36-36.9	1.20
26-26.9	1.00	37-37.9	1.22
27-27.9	1.02	38-38.9	1.24
28-28.9	1.04	39-39.9	1.26
29-29.9	1.06	40 & above	1.28

†Refugio

Same prices as above Gulf Coastal crudes, plus these grades:

40-40.9	$1.28	43-43.9	$1.34
41-41.9	1.30	44-44.9	1.36
42-42.9	1.32	45 & above	1.38

†Includes also Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor crudes.

*Humble's prices apply in these Texas fields: Amelia, Clear Lake, Goose Creek, Mykawa, Sugarland, Thompsons, Webster and West Columbia.

Oct. 11, 1938, Stanolind posted in Clinton, Hastings, High Island, So. Houston, and Spindletop, same prices as Humble in Texas Gulf Coast fields, except that Stanolind's lowest grade is below 21, at $0.82.

Oct. 12, 1938, The Texas Co. posted for Texas & La. Gulf Coast crude: $0.82 for below 21, plus 3c to 26-26.9, which is $1; from there on, 2c, to 34 & above, which is $1.16. In Refugio, same as other Gulf Coast, except highest gravity is 28 & above, $1.04.

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.

(Effective Oct. 11, 1938)

Salt Creek, (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma-Kansas, ranging from $0.86 to $1.10, which see under Mid-Continent crude on previous page.

Tensleep, Salt Creek field	$0.646
Iles, light, Col.	0.98
Iles, heavy	0.92
Elk Basin, light	0.90
Grass Creek, light	0.90
Frannie light	0.55
Grass Creek, heavy	0.40
Hamilton Dome, Wyo	0.35
Frannie heavy	0.42

Posted by Ohio Oil Co.

(Effective Oct. 11, 1938)

Elk Basin, Wyo.	$0.90
Grass Creek, light	0.90
Rock Creek	1.00
Lance Creek	0.77
Dry Creek, Mont.	0.92

(Effective May 1, 1938)

Grass Creek heavy.....$0.50

(Effective Nov. 16, 1937)

Sunburst, Mont.....$0.90

Posted by Continental Oil Co.

(Effective Oct. 11, 1938)

Cat Creek, Mont.	$1.10
Big Muddy, Wyo	0.98
Lance Creek, Wyo	0.77

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 26, 1936, except Huntington Beach, Playa del Rey, Santa Fe Springs, Kern Front, Signal Hill (Long Beach) effective March 7, 1936; Elk Hills effective June 22, 1936; Lakeview Area, Aug. 19, 1936; El Segundo and Wilmington, Oct. 15, 1937; Greeley-Canal, July 9, 1938; Santa Maria Valley, by Union Oil, Oct. 15, 1938.

Gravity	Signal Hill (Long Beach) El Segundo †Wilmington	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda Brea Canon	Athens Rosecrans	Dominguez	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	‡Newhall and others	Mountain View	Elk Hills	Buena Vista Hills Midway-Sunset Lakeview Area	Greeley-Canal (Kern County)	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria (Union Oil)
13-13.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	$0.63
14-14.9	$0.80	$0.79	$0.74	$0.78	$0.79	$0.80	$0.76	....	....	$0.80	$0.76	$0.76	$0.77	$0.78	....	$0.70	....	$0.70	$0.70	....	$0 0	$0.70	....	.65
15-15.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.68
16-16.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.70
17-17.9	.80	.79	.74	.78	.81	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	.70
18-18.9	.80	.79	.74	.78	.84	.80	.78	....	....	.82	.76	.76	.77	.78	....	.70	....	.70	.70	....	.70	.70	....	....
19-19.9	.82	.79	.74	.82	.87	.84	.81	....	....	.85	.76	.78	.77	.78	....	.70	.70	.74	.74	....	.74	.71	.70	....
20-20.9	.85	.79	.74	.85	.90	.88	.84	....	....	.88	.78	.82	.77	.80	....	....	.70	.78	.78	....	.78	.72	.70	....
21-21.9	.88	.79	.74	.89	.93	.93	.88	....	....	.91	.80	.85	.77	.84	.78	....	.73	.82	.82	....	.82	.74	.70	....
22-22.9	.92	.82	.74	.92	.96	.98	.92	....	....	.93	.84	.89	.79	.88	.78	....	.77	.87	.87	....	.86	.78	.72	....
23-23.9	.95	.86	.77	.96	.99	1.02	.96	.84	.79	.96	.88	.93	.82	.92	.78	..	.80	.92	.92	....	.90	.82	.76	....
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	.99	.91	.96	.85	.96	.82	....	.84	.97	.97	....	.94	.86	.79	....
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	1.02	.95	....	.89	.99	.86	....	.88	1.01	1.01	....	.98	.90	.83	....
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	1.05	.98	....	.92	1.03	.90	....	.91	1.06	1.06	....	1.02	....	....	....
27-27.9	1.10	1.05	.88	1.11	1.12	....	1.10	1.03	.88	....	1.02	....	.96	1.06	.95	....	.95	1.10	1.10	$0.91	1.06	....	....	....
28-28.9	1.14	1.10	.90	1.14	1.15	....	1.14	1.07	.90	....	1.06	....	.99	1.10	.99	....	.99	1.15	1.15	.94	1.10	....	....	....
29-29.9	1.17	1.15	.93	1.18	1.18	....	1.17	1.12	.93	....	1.09	....	1.03	1.14	1.03	....	1.02	1.20	1.20	.98	1.14	....	....	....
30-30.9	1.21	1.19	.95	1.22	1.21	....	1.21	1.17	95	....	....	....	1.07	1.17	1.08	....	1.06	1.25	1.25	1.02	1.18	....	....	....
31-31.9				....	1.24		1.24	1.22	97	....	....	....	1.11	1.21	1.12	....	1.09	1.29	1.29	1.06				....
32-32.9		*Elwood Terrace		....	1.27		1.27	1.27	1.00	....	....	....	1.14	1.25	1.16	....	1.13	1.34	1.34	1.09	Kettleman Hills			....
33-33.9	....	1.28	....	....	....		....	1.32	....	....	....	....	1.18	1.28	1.20	....	1.17	1.38	1.38	1.13	....	1.19	....	....
34-34.9	....	1.32	....	....	....		....	1.37	....	....	....	....	1.22	1.32	1.25	....	1.20	....	....	1.17	....	1.23	....	....
35-35.9	....	1.35	....	....	....		....	1.42	....	....	....	....	1.25	....	1.29	....	....	....	....	1.20	....	1.27	....	....
36-36.9	....	1.39	....	....	....		....	1.46	....	....	....	....	1.29	....	1.33	....	....	....	....	1.24	....	1.31	....	....
37-37.9	....	1.43	....	....	....		....	1.51	....	....	....	....	1.32	....	1.37	....	....	....	....	1.28	....	1.35	....	....
38-38.9	....	....	....	....	....		....	1.56	....	....	....	....	1.36	....	1.42	....	....	....	....	1.31	....	1.39	....	....
39-39.9	....	....	....	....	....		....	1.61	....	....	....	....	1.40	....	....	....	....	....	....	1.35	....	1.43	....	....
40-40.9	....	....	....	....	....		....	1.66	....	....	....	....	1.43	....	....	....	....	....	....	1.39	....	....	....	....
41-41.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.43	....	....	....	....
42-42.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.46	....	....	....	....
43-43.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.50	....	....	....	....
44-44.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.54	....	....	....	....
45-45.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.57	....	....	....	....
46-46.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.61	....	....	....	....
47-47.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.65	....	....	....	....
48-48.9	....	....	....	....	....		....	....	....	....	....	....	....	....	....	....	....	....	....	1.68	....	....	....	....

F. O. B. Standard Pipe Line

*F. o. b. ship.

‡Also McKittrick, Kern River. Kern Front and Round Mountain $0.70 thru 19.9 gravity; no higher gravity quoted.

†Wilmington prices differ on gravities below 18.9. Prices are: 14-16.9, $0.75; 17-17.9, $0.77; and 18-18.9, $0.79; rest of schedule same as Signal Hill.

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Coming Meetings

National Assn. of Credit Men, Petroleum Refiners Division, Indianapolis, Athletic Club, Indianapolis, Ind., Oct. 24, 25, 26.
National Oil Marketers Assn., Morrison Hotel, Chicago, Oct. 24, 25.
National Tax Conference, Hotel Statler, Detroit, Oct. 24 to 28.
National Petroleum Assn., Dept. of Fire & Accident Prevention, Semi-Annual Meeting, Olean, N. Y., Oct. 26.
National Battery Manufacturers Assn., 14th annual convention, Hotel Sherman, Chicago, Oct. 27, 28.
Mid-Continent Oil & Gas Assn., Texas Division, San Antonio, Tex., Oct. 27, 28, 29.
Western Petroleum Refiners Assn., Technical Group Meeting, Washington-Youree Hotel, Shreveport, La., Oct. 28.
American Trucking Assns., Inc., 5th annual convention, Detroit, Oct. 31-Nov. 2.
Oil Trades Assn. of New York, annual banquet, Waldorf-Astoria Hotel, New York, Nov. 1.

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1	3-Compartment Horizontal, Electrically Welded with supports (⅜" x 2½" Angle Irons—8' Tank to Foundation.)		
1	Vertical Riveted	8 x 17	6510 Gal.
1	Vertical Riveted	7 x 12	4150 Gal.
1	Vertical Riveted	7 x 12	3890 Gal.
1	Vertical Riveted	7 x 12	3890 Gal.
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1	Vertical Elec. Welded	6 x 12	2580 Gal.
1	Vertical Elec. Welded	6 x 14	3040 Gal.

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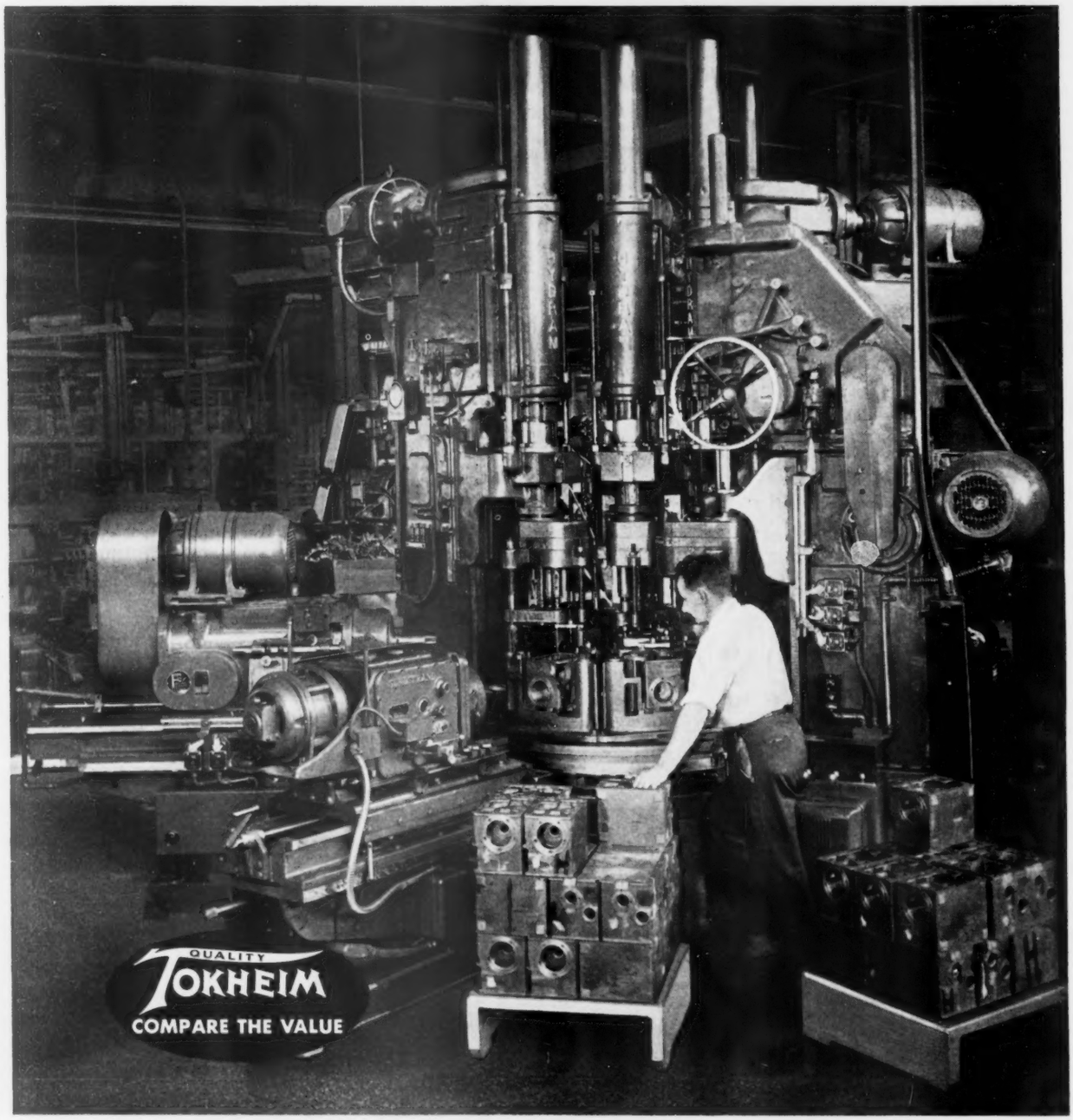

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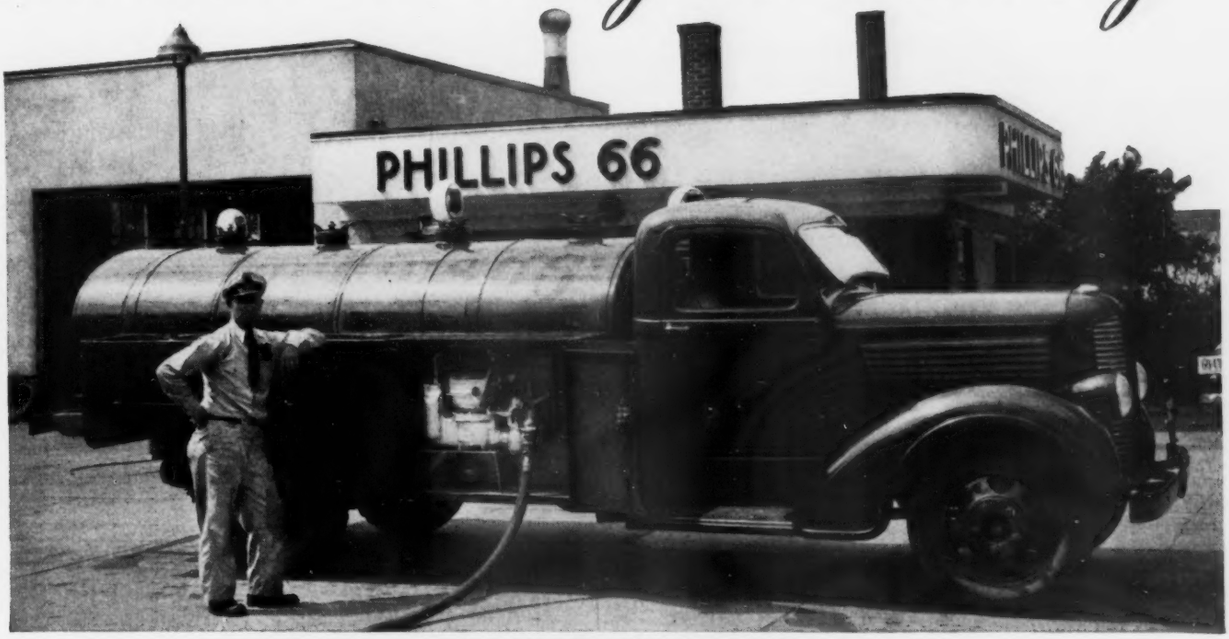

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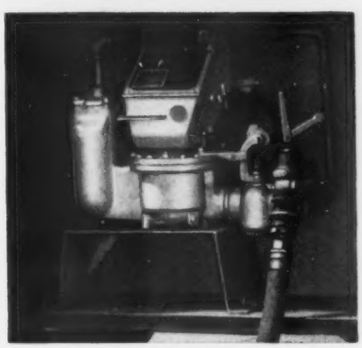

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Photograph by Bachrach

Chester Narramore

● Chester Narramore, of New York, new assistant secretary of the American Institute of Mining and Metallurgical Engineers, who will serve as secretary for its petroleum division, has been associated with the oil industry since he graduated from Stanford University in 1903.

He was first with the California Mining Bureau, then with the U. S. Geological Survey on the Pacific Coast. After spending several years with oil interests on the Pacific Coast and the northwest, Narramore became head of the U. S. Bureau of Mines petroleum division in 1917. He later spent several years in oil field exploration work in foreign lands for American oil companies, has since been a consulting engineer in New York.